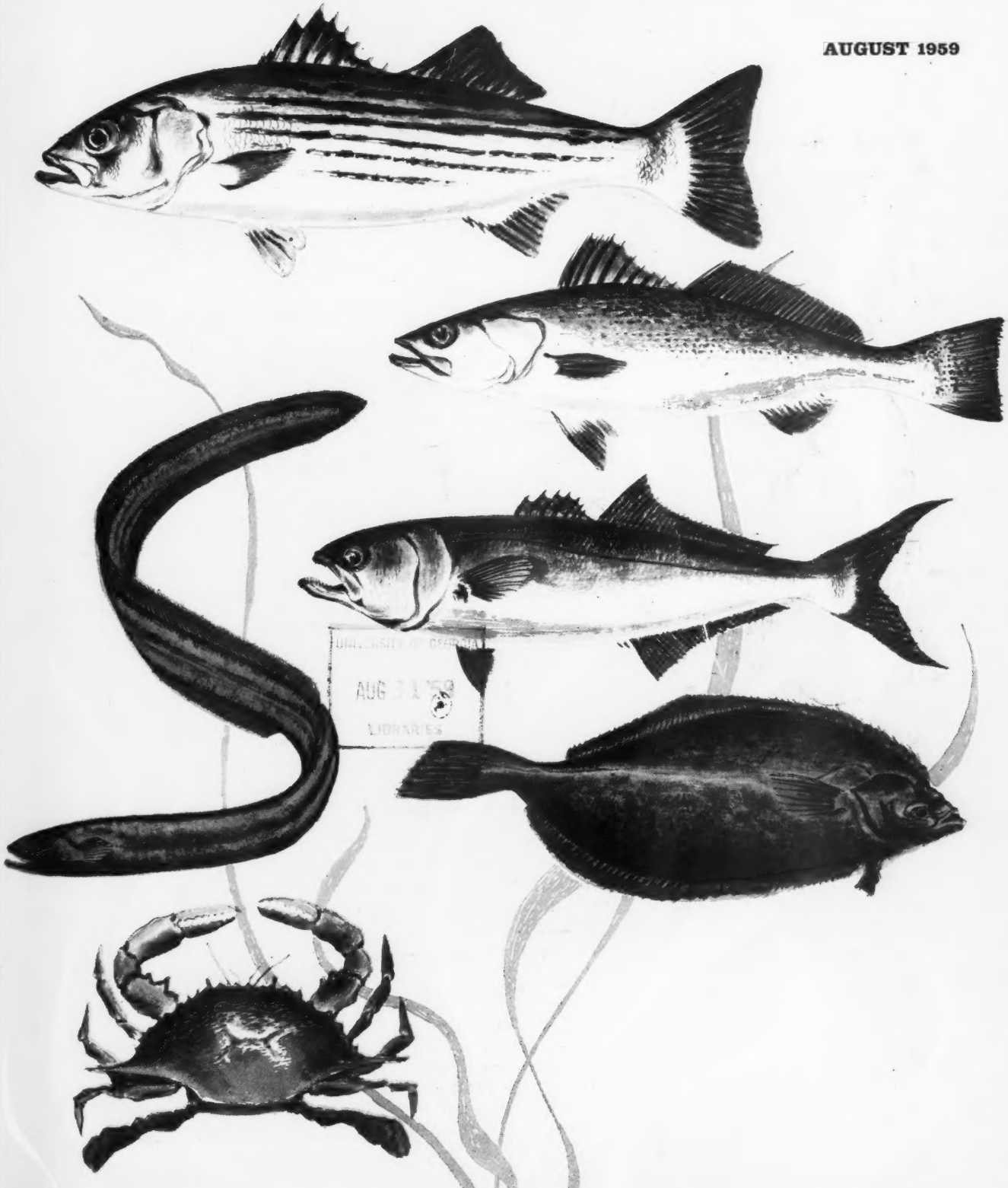
DRUG & COSMETIC INDUSTRY

AUGUST 1959



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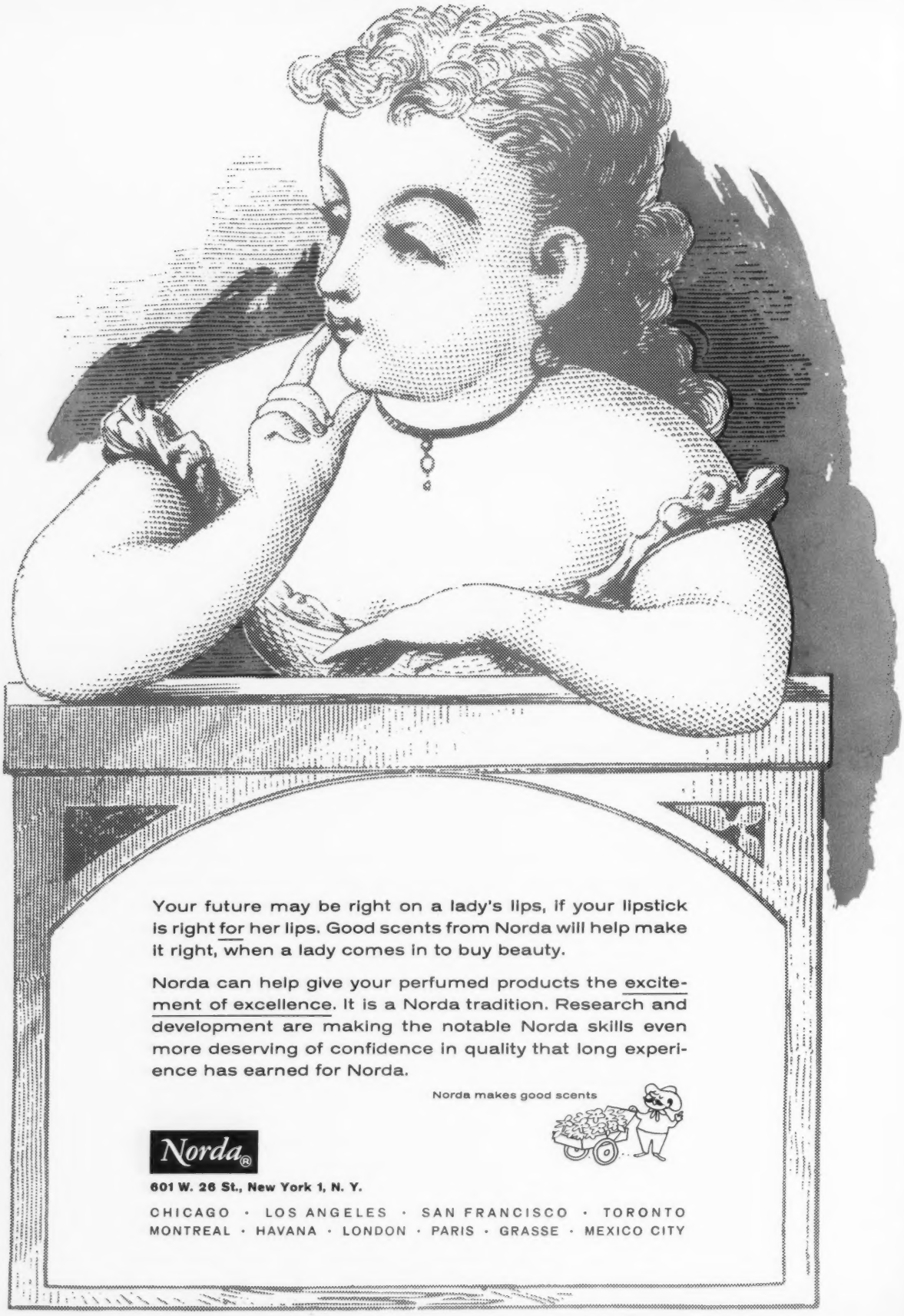

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Drug and Cosmetic Industry

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Editor THOMAS R. FARRELL
Managing Editor GRACE McGRAW SMITH
Technical Editor JOSEPH KALISH, Ph.D.
Raw Material Editor HARRY G. KELBLY
Production Consultant FRANCIS CHILSON
Art Director MAX FRANKEL

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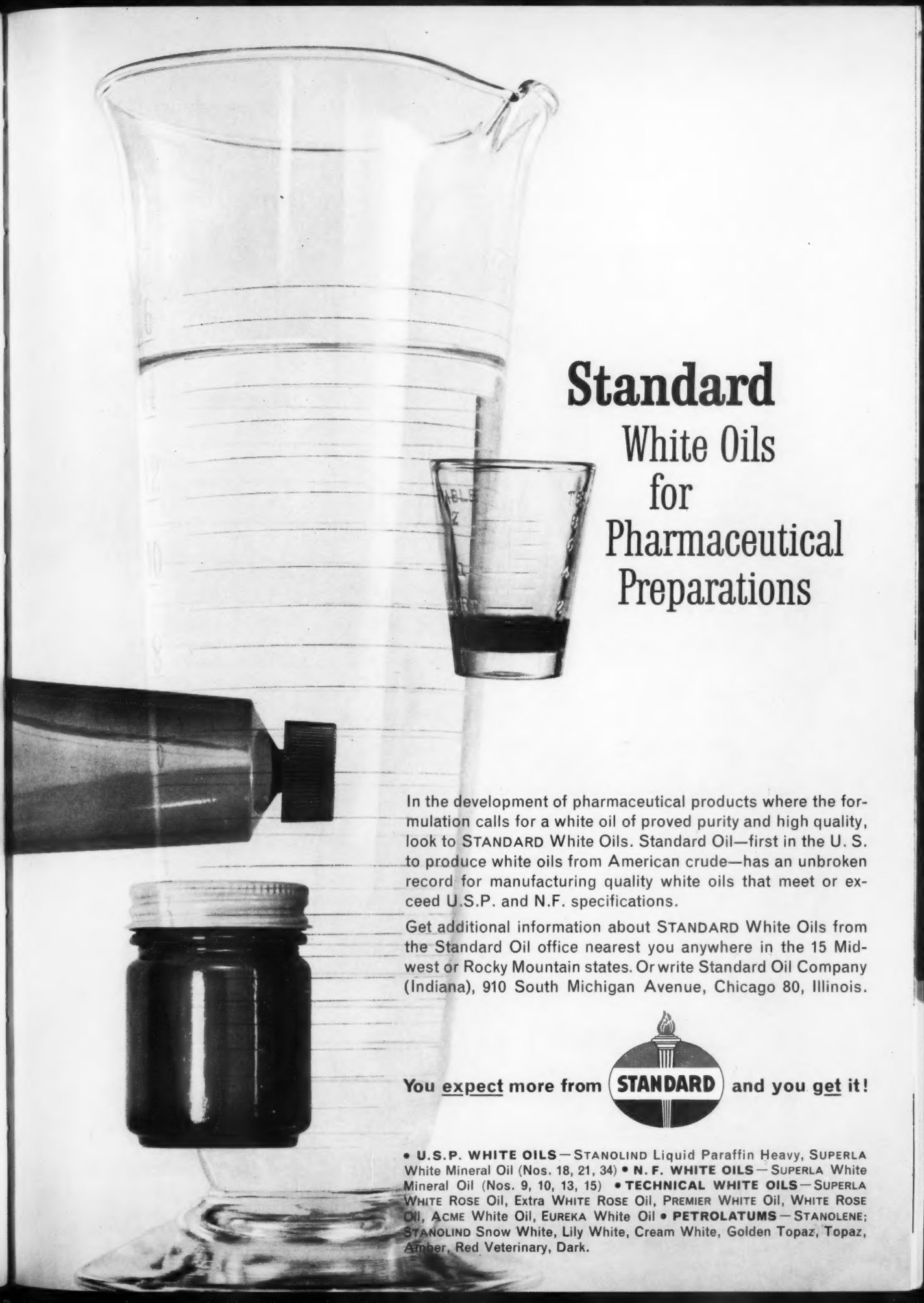

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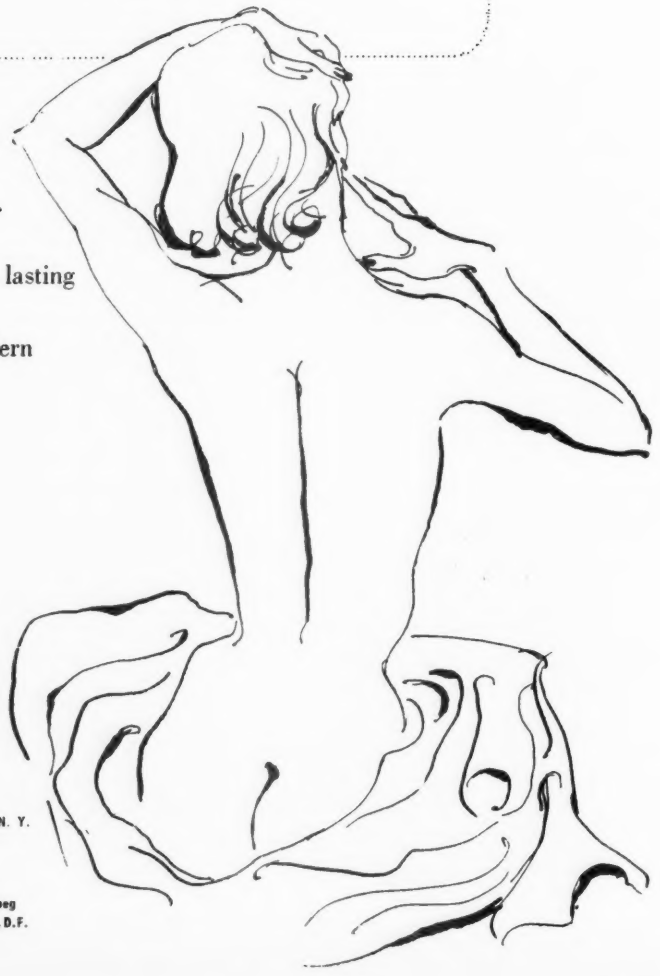

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cellulose acetate phthalate

In Paris, the City of Light, at 23, rue de l'Ecole-de-Médecine, there has been published a brochure prepared by the late Albert Couvreur and collaborators, and bearing the title, "Les enrobages modernes des dragées et des pilules." It devotes itself in part to cellulose acetate phthalate, a substance of our invention.

States this magnificent document (as inadequately rendered into the English tongue by our own poor efforts):

"But the largest part of our work was reserved for cellulose acetate phthalate. This product is extremely insoluble in the acid solutions and its solubility in pancreatic medium is due in part to a fermenting action which can be produced independently of pH, but can equally work in an alkaline medium. According to the fine demonstration of our co-worker . . . cellulose acetate phthalate is an ester which is hydrolyzed by esterase with a formation of acetic and phthalic acids and this explains all the interest in this new coating.

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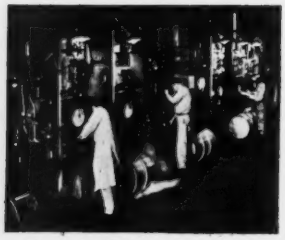

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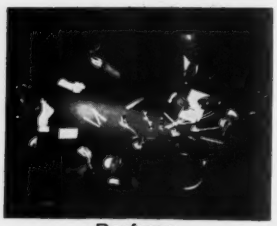

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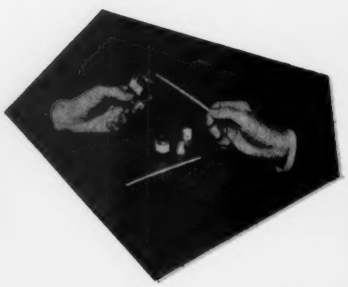
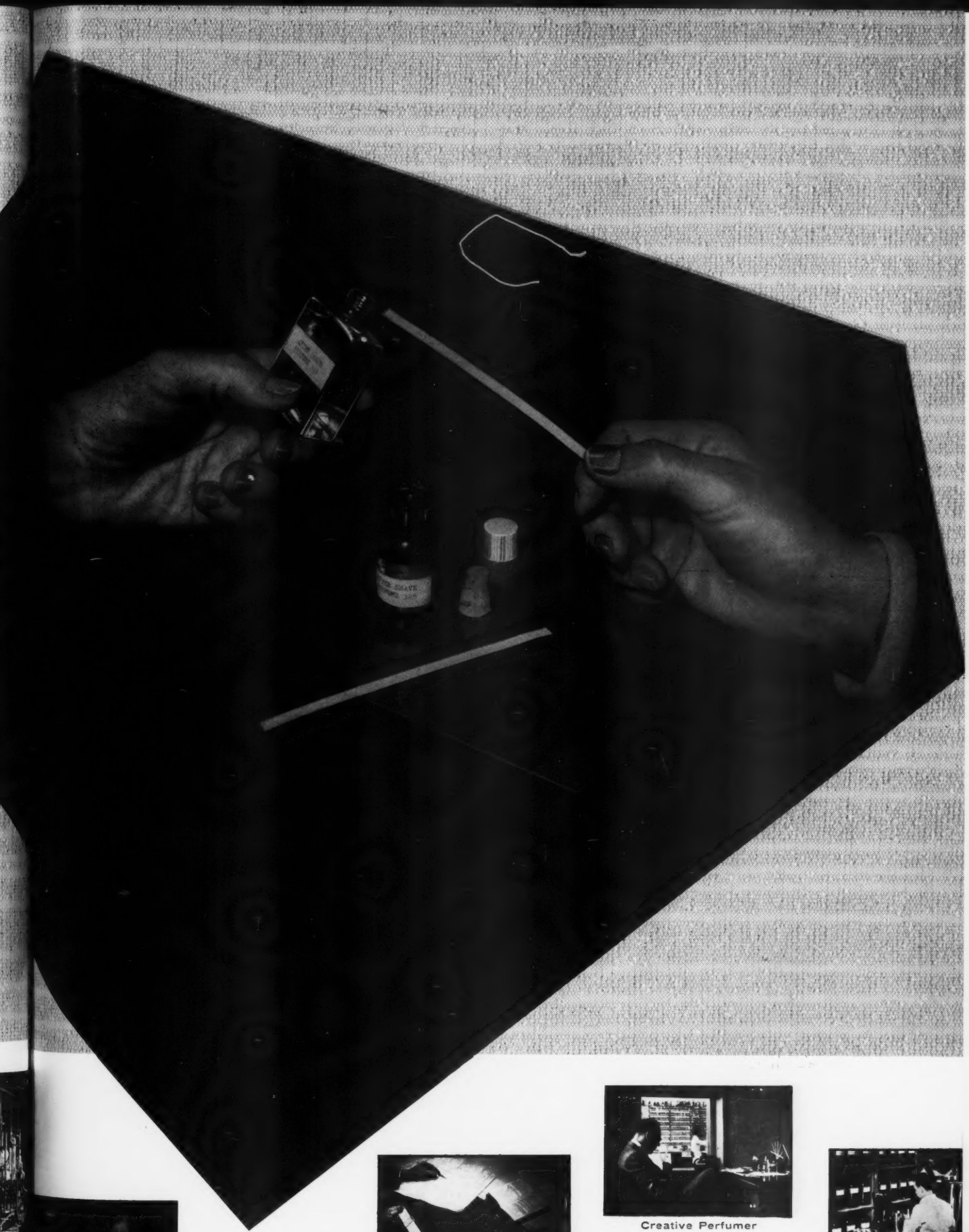
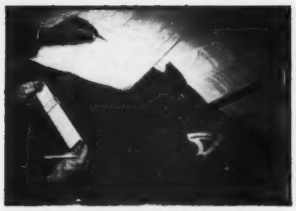


Sales

Aromatic
Chemical Research



Cosmétic Research



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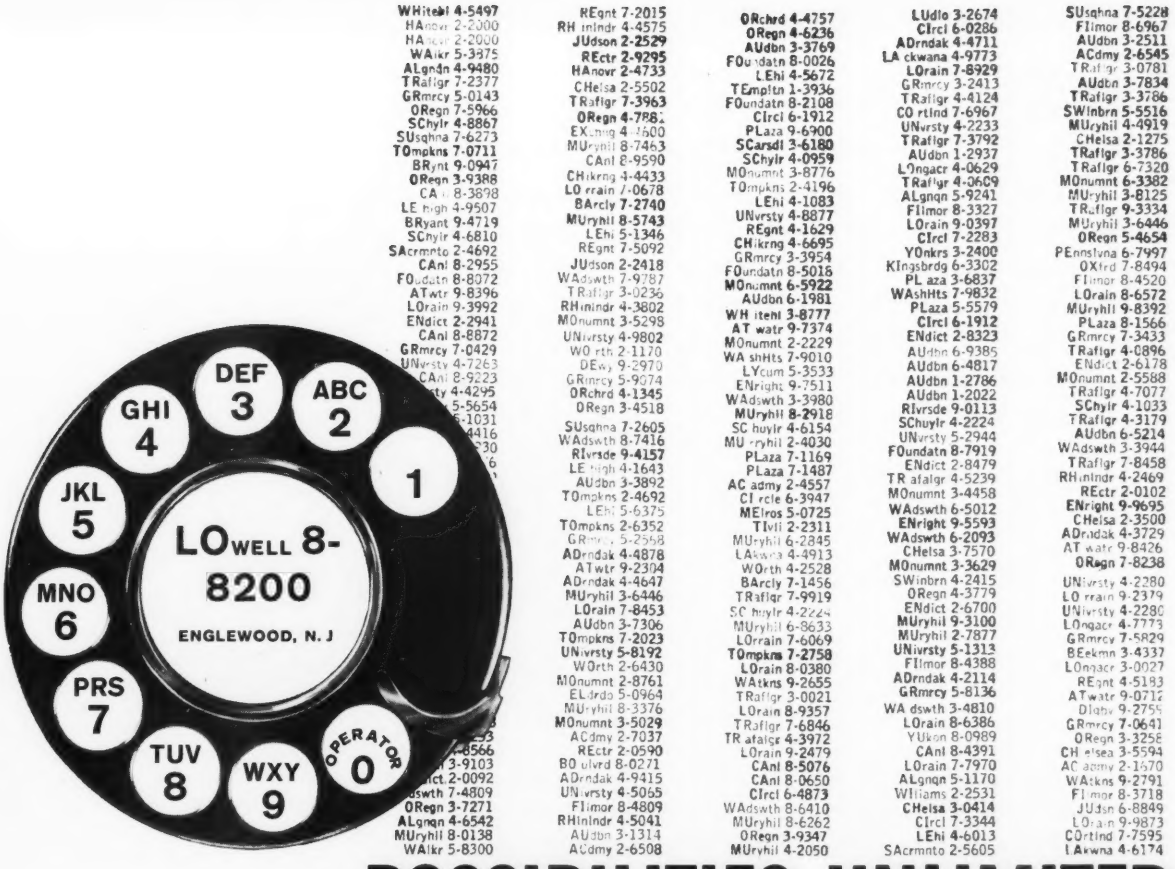

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DOW | **CHEMICALS** numerous types, many possibilities

Many chemical species have given birth to the products used in today's complex chemical world. Two families of increasing importance to the pharmaceutical industry are the organic bromides and the amino acids. Following is a brief discussion of these families which includes important news about fourteen amino acids, brominated products and ion exchange resins.

You may wish to check certain items in this advertisement and forward to those concerned in your company.

ROUTE TO:

_____

_____

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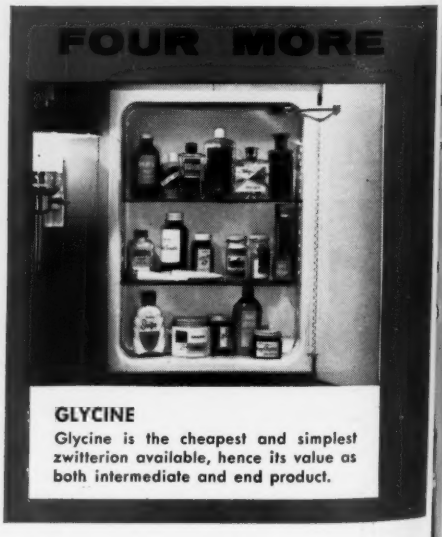
Australians are the tallest people in the world, Americans just a shade behind. The people of India and China are among the shortest—and their life expectancy is considerably less than half that of Australians and Americans. Why? It is no coincidence that the Asian diet contains less protein by far.

Dow amino acids now available for research may show the way to a solution of some of the world's most serious nutrition problems.

Malnutrition caused by protein deficiency may someday be defeated by research on the essential amino acids now being carried on in pharmaceutical laboratories around the world.

For years, the chief obstacle to speedier progress in amino acid research was the prohibitive cost of the substances themselves. Now, Dow—which has long supplied glycine, methionine and acetylmethionine in commercial quantities—is prepared to deliver other amino acids in quantities and prices practical for research.

Dow can now synthesize seven of the eight amino acids considered essential for humans and seven nonessential



GLYCINE
Glycine is the cheapest and simplest zwitterion available, hence its value as both intermediate and end product.

amino acids. Threonine, the eighth essential, is the subject of continuing laboratory study and may soon be added to the list.

The potential of the amino acids in animal nutrition is already well recognized. The various substances which, by reason of availability and price, are commonly used as farm animal feeds, are usually deficient in one or more of these growth-promoting ingredients. Addition of the commercially available amino acids—such as methionine and glycine—has been a major factor in bringing feeds up to higher nutritional levels than was ever before possible.

The ultimate potential of the amino acids, however, has not even been approached. The outlook is limitless. Lysine, for example, is thought by many to have marvelous possibilities as a supplement to the human diet. It has reportedly brought substantial help to infants whose growth rates were below average and appetites poor. Tryptophan, too, merits extensive and serious study, as do *all* the essentials.

Dow built its amino acid pilot plant not to capitalize on an immediate demand, but to stimulate and promote research on these fascinating chemicals. Dow is anxious to work with pharmaceutical firms with a serious interest in extending the effective use of the amino acids. When new and better uses are found, Dow will be ready with adequate production at the lowest feasible cost.

★ ★ ★ ★

If news of these products has made you want to know more, let us know. We'll be happy to answer your questions about these or any other Dow products for the pharmaceutical industry. Write THE DOW CHEMICAL COMPANY, Midland, Michigan, Chemicals Merchandising Department 961 AW8.

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ideal intermediate building blocks

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These building block chemicals—outstanding for purity and uniformity—have many characteristics that make them ideal for the intermediate job.

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Brominated products: ideal building blocks for pharmaceutical industry.

be used in the preparation of a Grignard reagent and in Ullman and Friedel-Crafts reactions—as well as in reactions involving the removal of bromine and its replacement with amines, hydroxyls and nitriles. It is an extremely useful and versatile product.

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Common pharmaceutical uses are in the recovery of streptomycin from fermentation broths and in the analysis of alkaloids. But the possibilities are endless. Whether the process is metathesis, concentration, purification, fractionation or catalysis—it's a good possibility that Dowex ion exchange resins can do it better, cheaper or faster.

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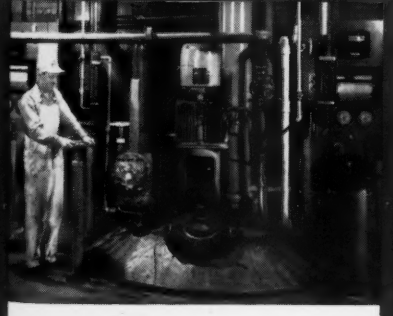
CHEMICALS OF INTEREST



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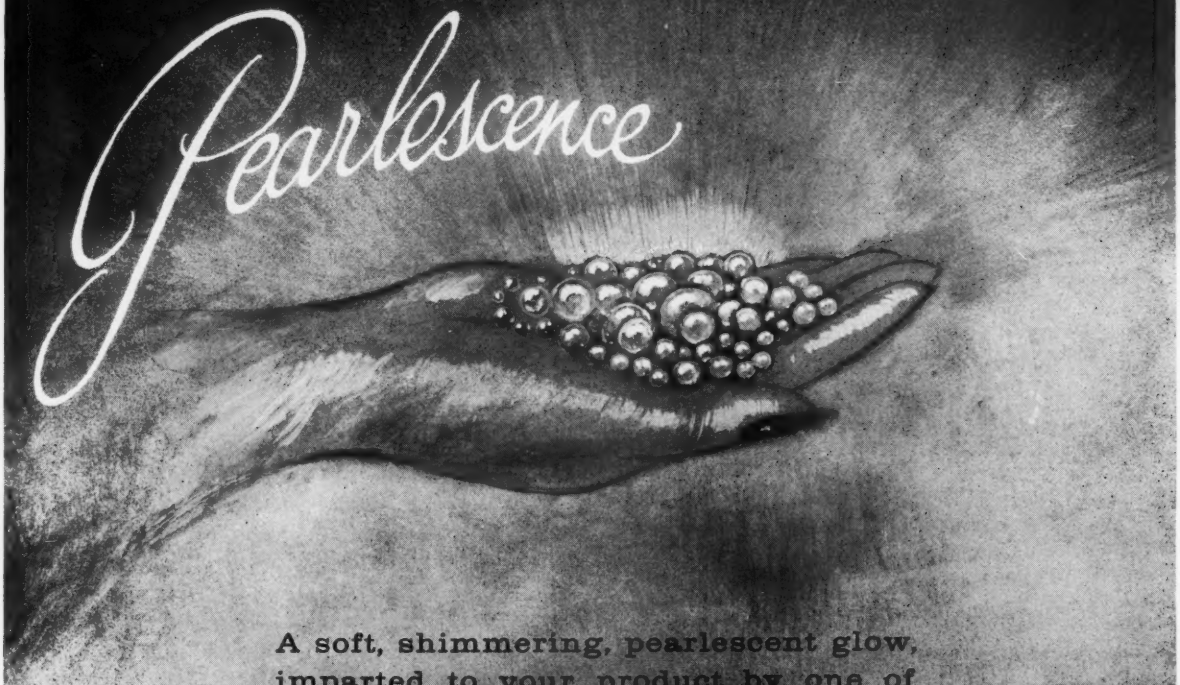

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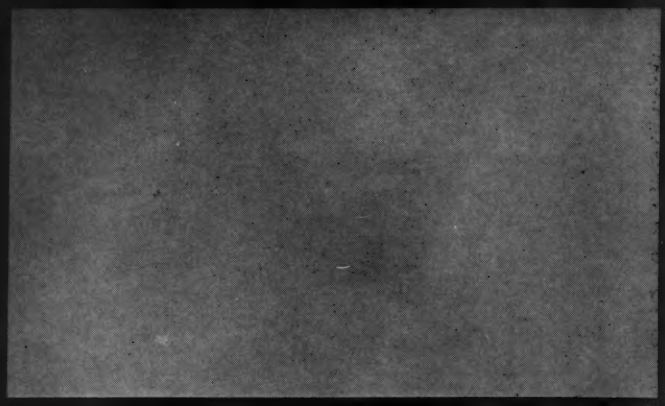

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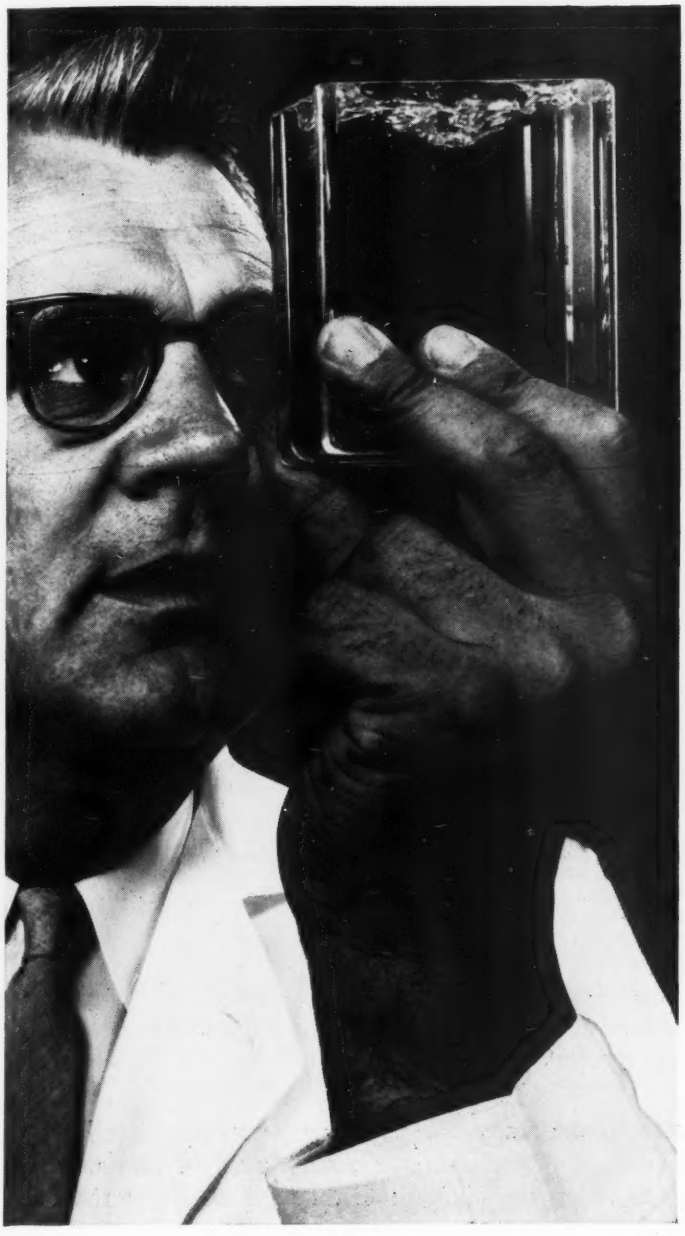

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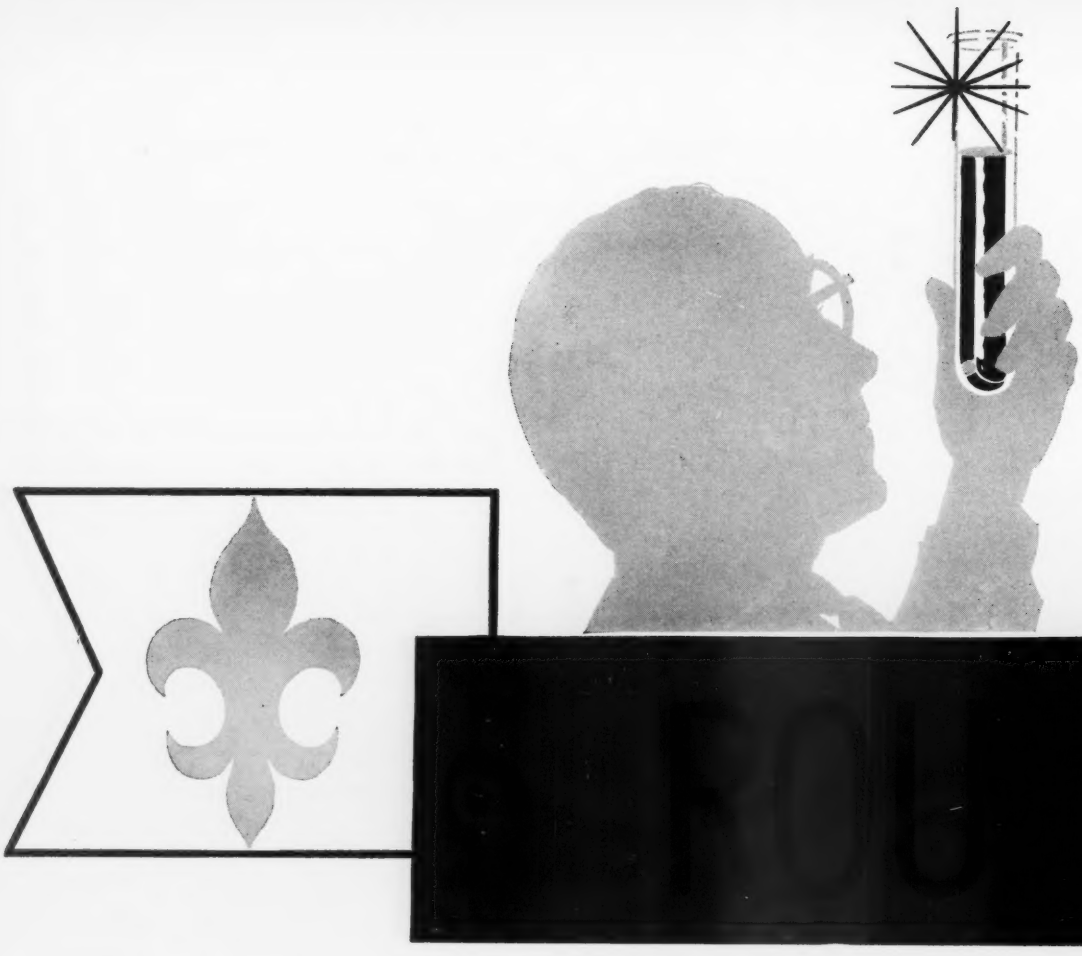

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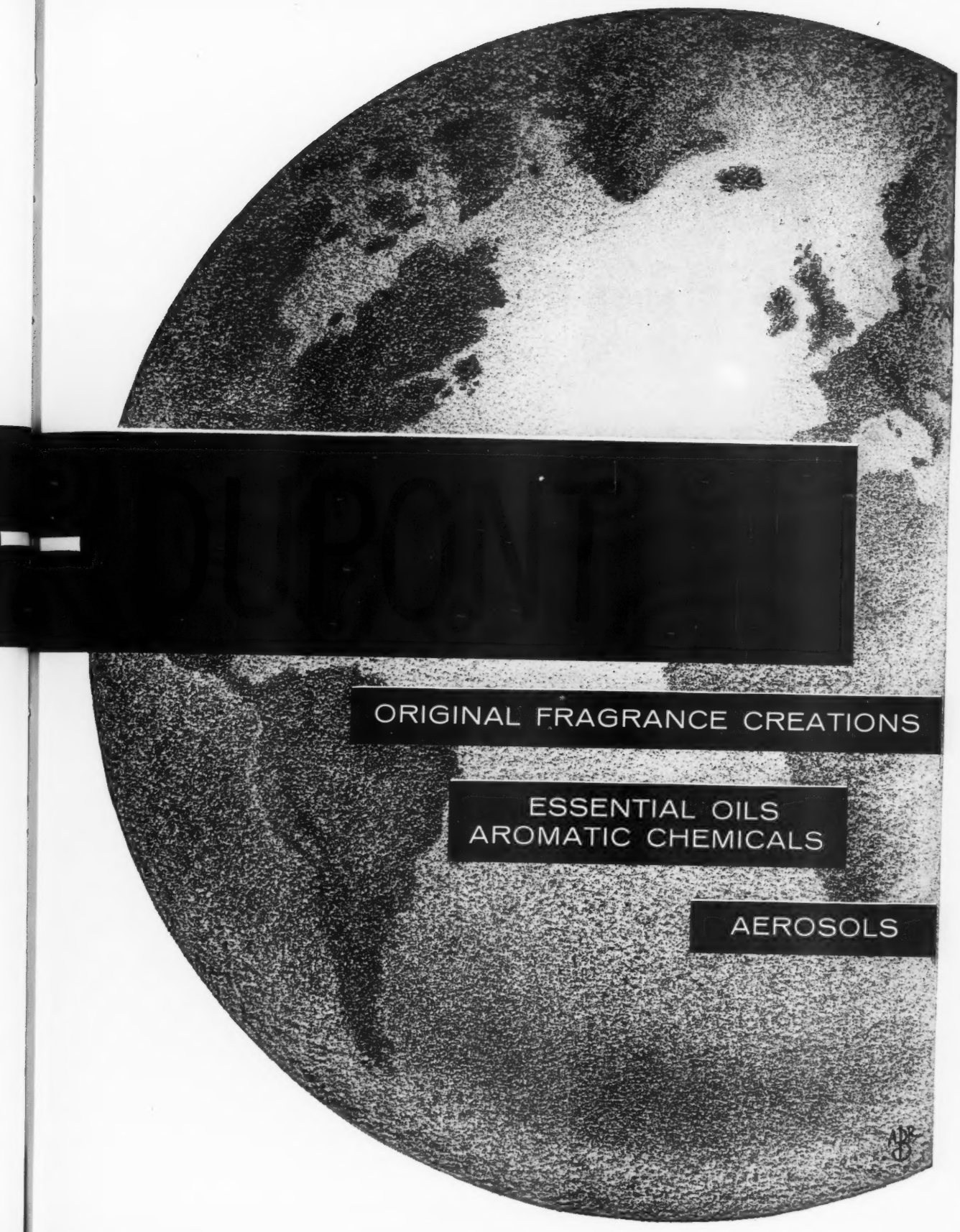
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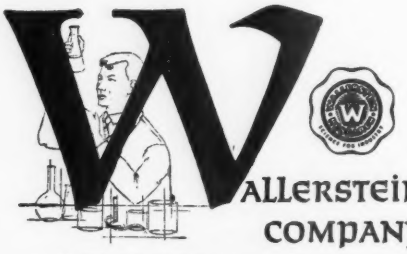

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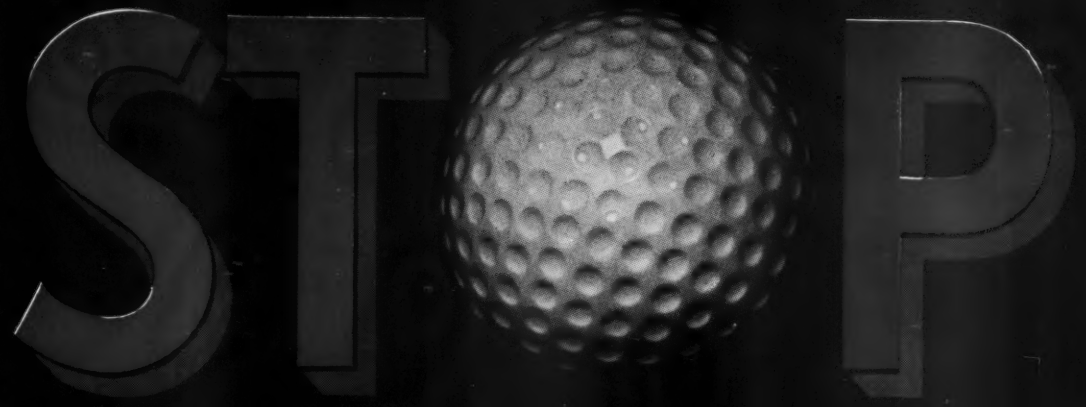

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Physical Properties	HYDROXYLAMMONIUM SULFATE
Formula	$(NH_2OH)_2 \cdot H_2SO_4$
Molecular Weight	164.14
Melting Point, °C	177*
pH of 0.1 M Aqueous Solution at 25°C	3.7
Solubility in 25°C, g/100 g solvent	
In Water	63.9
In 95% Ethanol	0.2
In Methanol	0.1

*Melts with decomposition.

"HS" destroys the peroxide polymerization catalyst as soon as polymerization has progressed to the desired stage. Products of decomposition are oxides of nitrogen which do not remain in the final product. "HS" is adaptable to both hot and cold polymerizations.

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"My wife wants a pill to keep me awake after supper and asleep in bed."

Keeping Posted

The Fickle Germs

The fickleness of germs that cause common infections is not appreciated by many physicians, according to Dr. Bert H. Leming Jr. who is associated with the Division of Pathology and Microbiology of the University of Tennessee and City of Memphis hospitals. The sensitivity of such germs can change abruptly from month to month and from place to place even in the same region, he said. For that reason the physician cannot rely on published reports or even on his own past experience in choosing drugs against an infection. He suggested that local groups such as county medical societies might profitably circulate monthly lists to keep their members up-to-date on the efficacy of available antibiotics against local strains of disease-causing bacteria. He also urged wider use of bacterial testing techniques to match an infection with the best antibiotic available against it. Dr. Leming said that "blind selection" of a drug without thorough testing of the infecting germ was not uncommon. As to reliance on normal publication of research, he noted that periods of several months often elapsed between completion of a study of its publication.

Dr. Leming's study, involving 7,000 laboratory specimens, showed that effectiveness of a given antibiotic could vary as much as 30 per cent between hospitalized patients and a doctor's office patients in the same city. In a given community the effectiveness of a drug might drop 35 per cent or more from one month to the next, he said. A large portion of the tests were done on staphylcocci.

Live Polio Vaccine

U. S. Public Health Service Surgeon General Leroy E. Burney has stated that on basis of present scientific information available, the live polio vaccines will not be licensed for use in this country. Dr. Burney said that recent reports had provided "encouraging" but not as yet complete scientific data on which to base a real judgment as to the effectiveness of these live vaccines." He said there should be more controlled studies, which the USPHS would continue to follow with interest and hope and an "open mind."

The Salk killed vaccine, said Dr. Burney, has been proved safe, 90 per cent effective, and should be used to the utmost to prevent paralizing polio.

Health, Education, and Welfare Secretary Arthur S. Flemming said: "I think that makes awfully good sense. We have one approach concerning which there are unresolved questions. Another approach has proven its safety. We should take full advantage of the effective, safe vaccine."

Certainly, with the Salk vaccine available, and proving both effective and safe, there is no pressure on the USPHS or anyone else to license another vaccine until all questions regarding the effectiveness and safety are completely resolved. Also, it is apparent that the Department of Health, Education, and Welfare, as well as the USPHS, has a good memory. It will be recalled that Oveta Culp Hobby went out after the snafu over the Salk vaccine and its distribution. It will also be recalled that the USPHS was not too completely in the clear since the Salk vaccine that caused damage was proven to have been produced in complete compliance with the specifications laid down by the Service.

Despite these statements, Lederle Laboratories have plans to mass-produce their three-in-one doses of live vaccine, and might apply for a license to produce this cherry-flavored oral product as early as September or October, in time for the 1960 polio season. However, the company made it clear that it would not apply for a license unless it was certain of getting it.

Lederle said that $1 million worth of additional facilities for producing the vaccine will be completed within six months. This is in addition to $7 million

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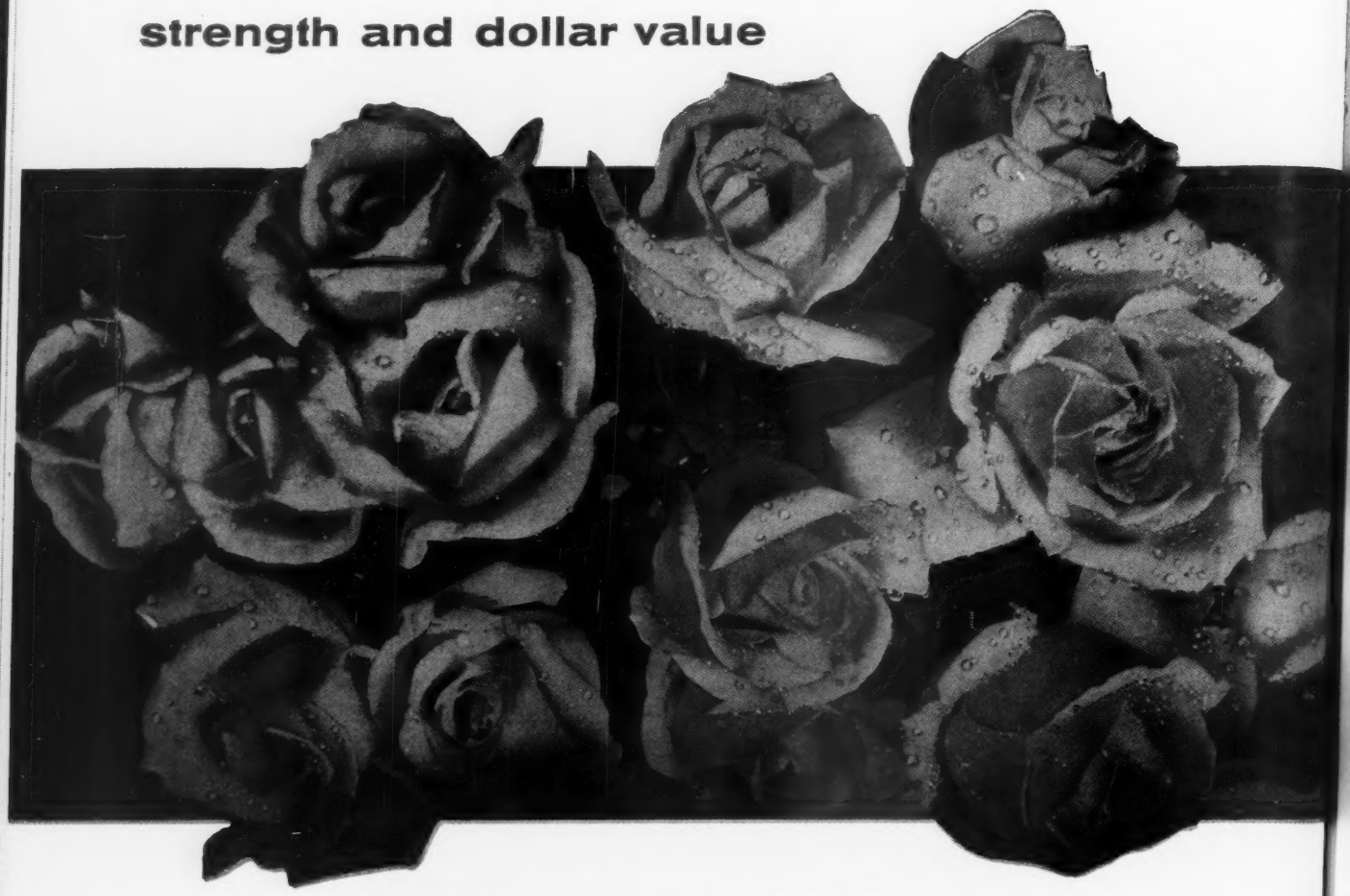

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already invested in thirteen years of development work.

Lederle scientists are apparently pinning their hopes for imminent approval on what they seem to regard as a critical test in Costa Rica, which will be the largest controlled test ever made on a live vaccine. Lyman C. Duncan, general manager of Lederle, said it involved all Costa Ricans under 11 years of age, or a total of 448,000 children in the most susceptible age group. "In addition," said Mr. Duncan, "the standards of public health and medical facilities in Costa Rica are very high, so that the results of this study should be especially significant for the United States."

Butazolidin Volume

The U. S. Tariff Commission reports that imports of Butazolidin were 35,386 pounds. This amount of material would make over 16 million tablets of 100 milligrams each. With a retail price level of 10 cents a tablet, which would indicate a manufacturer's price level of about 5 cents a tablet, this should indicate a total manufacturer's sales volume of $8 million for this arthritic drug specialty.

Texas Protects Trademarks

Texas Pharmacal Company, owner and holder of the trademarks, Alleroreme and Saf-Tan, recently filed suit against Aloe-Creme Laboratories for cancellation of the company's registration of Alo-Creme, and also opposed its application for registration of Alo-Creme After Tan. In April 1958 the Examiner of Interferences of the U. S. Patent Office sustained the position of Texas Chemical in both respects, namely cancellation of the registration Alo-Creme was granted, and registration of Alo-Creme After Tan was refused. Alo-Creme Laboratories appealed to the Commissioner of Patents, but last month the decision of the Examiner of Interferences was sustained.

McKesson & Robbins Purchase

McKesson & Robbins has completed the purchase of Barada & Page in an exchange of 82,065 shares of McKesson & Robbins common stock to a value of close to $6.5 million. Barada & Page is a distributor of industrial chemicals throughout the South Central and Southwest states. In addition, the company repacks chemicals such as acids, solvents, chlorine, and ammonia. Its operations will be integrated with those of McKesson's chemical department. Walter M. Betters continues as president of Barada & Page, which is a subsidiary of McKesson, and has been appointed a vice-president of McKesson.

Pfizer Facts

Although Chas. Pfizer & Co. had record sales for the first half of this year totaling $122,898,523, up 15 per cent from $106,943,269 for the first half of last year, earnings were off slightly from $11,582,770, to $11,396,898. "The failure of earnings to keep pace with the sharp rise in sales is due to continued weaknesses in the prices for penicillin, streptomycin, steroids and bulk vitamins and to temporary importation problems in Brazil and Argentina," said President John J. McKeen in a message to stockholders. "These importation problems will be resolved when basic plants under construction in those two countries go into operation later this year." With reference to products, Mr. McKeen said:

"While maintaining their share of the domestic market, sales of our broad-spectrum antibiotics have been lower, reflecting the decline in demand from 1958 levels being experienced for these products by the pharmaceutical industry. Offsetting this decline is volume derived from some of the newer pharmaceuticals such as Diabinese, our oral anti-diabetic, and Daricin and Emarax, drugs for the control of ulcers."

"All our plants are operating at full capacity as a result of a heavy demand for a wide variety of Pfizer products and we anticipate that operations will be maintained at this rate for the balance of the year," he concluded.

Merck in Thailand

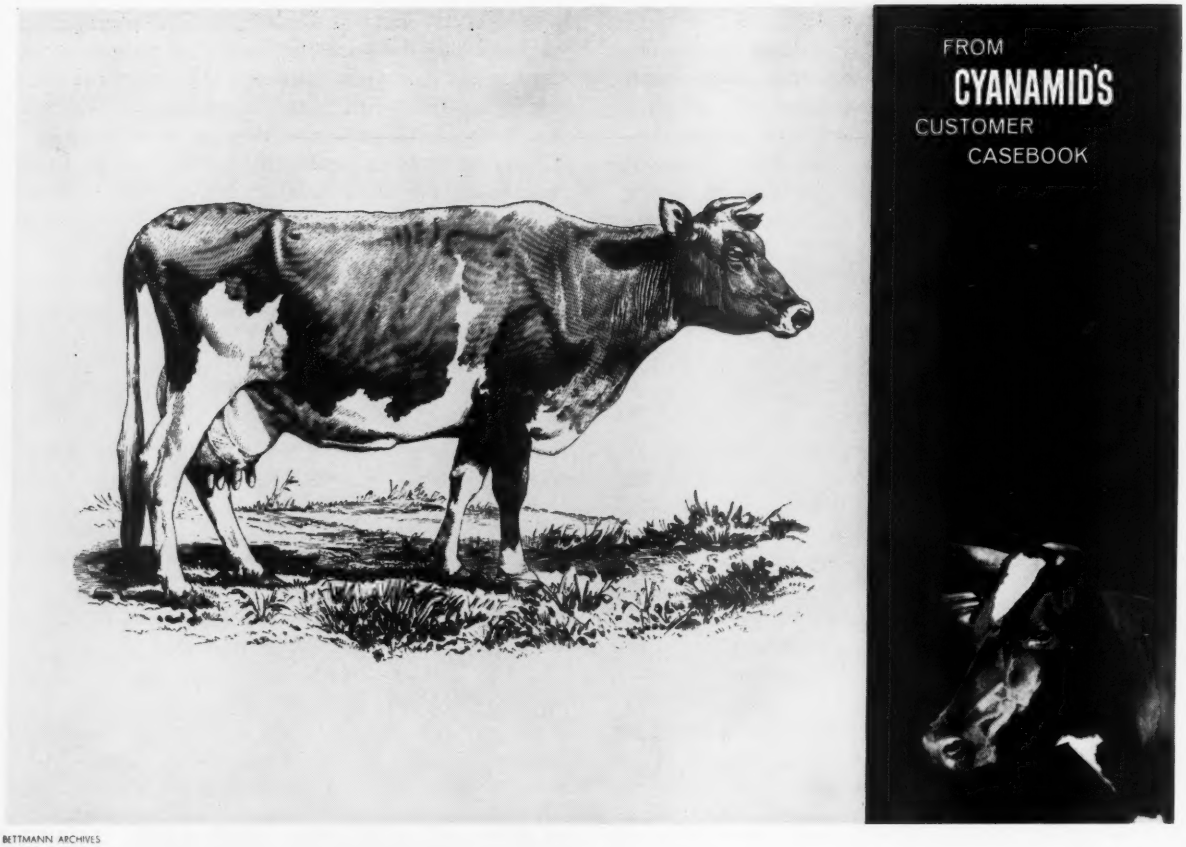
An agreement between the Thai government and Merck & Co., Inc. has been reached under which Merck will be the first chemical and pharmaceutical company licensed to establish manufacturing facilities in Thailand.

Mr. John T. Connor, president of Merck & Co., Inc., noted that the new Merck venture is the latest step in his company's international program, which "is being expanded with special emphasis on newly developing areas, where drug production is most needed." Last year Merck began a similar project in India, where it is constructing the largest privately owned ethical drug plant in that country and is also helping the government build a large state-owned streptomycin plant.

Merck Sharp & Dohme (Thailand) will produce vitamins, diuretics, steroids, antibiotics and other products from chemical intermediates. A 7½-acre tract of land in the vicinity of Bangkok, the capital, has already been purchased as a site for the new plant. Production will start about January 1, 1960, and full factory-scale manufacture is expected by about the middle of next year.

Initial investment for the new company, including plant and working capital, will come to about $1½ million. Of this Merck will invest directly $540,000 and B.L.H. Trading Company $360,000 for fixed assets. About $550,000 of working capital will be required, and this financing will be arranged by Merck Sharp & Dohme (Thailand).

Imports of pharmaceuticals into Thailand totaled about $16 million last year.



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Sixth Annual Cosmetic Seminar

The Sixth Annual Cosmetic Seminar of the Society of Cosmetic Chemists will be held on September 23 and 24 in New York at the French Institute, 22 East 60th Street and the subject will be "Percutaneous Absorption." The program was organized by the chairman, Dr. Everett L. Saul. The first session, with Dr. Saul as chairman, will be devoted to "Methods for Measuring Percutaneous Absorption" with papers by Dr. Saul, "On Examination of the Goals of the Cosmetic Manufacturer"; Dr. Irvin H. Blank, "Statement of the Problem, Definition of Terms, Critical Review of Past Methods"; Dr. Kenneth M. Wilson, "New Methods for Measuring Absorption"; followed by a panel discussion.

The afternoon session, "Factors Which Influence Percutaneous Absorption," with Dr. Blank as chairman and papers by Dr. R. D. Griesemer, "Biological Factors" and Dr. T. Higuchi, "Physico-Chemical Factors," will also be followed by a panel discussion.

The Thursday morning session, Dr. Paul Lauffer as chairman, will cover "Desirable Effects Resulting from Percutaneous Absorption of Cosmetic Chemicals," with papers by Dr. Max A. Goldzieher, "Estrogens"; Dr. Frederick D. Malkinson, "Steroids"; Dr. Val Cotty, "Salicylates"; and Dr. Saul Rubin "Vitamins." The afternoon session, "Possible Toxic Effects Resulting from Percutaneous Absorption of Cosmetic Chemicals," under the chairmanship of Dr. Raymond R. Suskind, will have papers by Dr. Suskind, "Methods for Predicting Toxic Reactions"; Dr. Donald J. Birmingham, "Survey of Some Cutaneous Toxic Reactions Caused by Cosmetic Chemicals"; Dr. L. J. Vinson, "Toxic Reactions from Penetration of Surfactants and Metals"; with a speaker not yet chosen, "Percutaneous Toxicity of Cosmetic Material." Both these sessions will also be followed by a panel discussion.

Registration for the seminar should be made as soon as possible with Mr. Walter Wynn, Society of Cosmetic Chemists, 2 East 63rd Street, New York 21, N. Y. The registration fee, $30.00, will cover attendance at the sessions as well as two luncheons, cocktails and dinner at the New York Academy of Sciences.

Symposium on Antibiotics

The Seventh Annual Symposium on Antibiotics to be held in Washington on November 4 to 6, will open with a general session on The Challenge of New Drugs in Our Society. It will be opened with a talk by Felix Marti-Ibanez, M.D. on The Great Historical Challenges in Medicine, to be followed by talks on The Challenge of New Drugs to the Pharmaceutical Industry, by Austin Smith, M.D., The Challenge of New Drugs to the Clinical Investigator, by Maxwell Finland, M.D., The Challenge of New Drugs to the Food and Drug Administration, by William H. Kessenich, M.D., and The Challenge of New Drugs to the Practicing Physician, by John C. Curry, M.D. Two panel discussions are also planned: 1. The Present Status and Problems Involved in Human Sensitization to Antibiotics, and 2. Chemotherapy of Acute and Chronic Pediatric and Geriatric Infections.

Colgate Held Up on Trademark

A trademark infringement suit brought on the West Coast by Jay S. Conley Co., makers of a detergent called Jeenie, against Colgate-Palmolive's heavy-duty detergent, Genie, might frustrate or even cancel Colgate's plans to promote Genie in that area. Federal Judge Willis Ritter rejected Colgate's plea for a six-month delay and ordered the company to stand trial August 24. "The little operator is entitled to some protection from the tremendous operations of someone like Colgate-Palmolive," he said. Meanwhile, Colgate has had to postpone its $1.8 million promotion program planned for Genie.

P. D. Four-in-One Vaccine

Initial shipments of Quadrigen, Parke, Davis' new four-in-one vaccine for simultaneous protection of children against polio, diphtheria, pertussis, and tetanus, were made last month. Shipments of 4½ cc. vials sufficient for primary innoculation of more than one-half million children were air-shipped to 22 Parke-Davis branches and depots. The new vaccine reduces from six to four the number of injections (including booster shots) required to immunize children against the four diseases. Three separate injections of ½ cc. each at four to six week intervals are reccommended for children six months to six years of age, with a booster dose six to 12 months after the initial series. For children under six months, four doses, spaced a month apart, are recommended.

Mallinckrodt Offers Debentures

Mallincrodt Chemical Works made a public offering last month of $6 million 5 per cent convertible subordinated debentures due 1974, priced at 100 per cent and accrued interest. The debentures are convertible during their life, unless previously redeemed, into 16 shares of class A common stock for each $1,000 principal amount (equivalent to a conversion price of $62.50 per share). The debentures are subject to redemption at prices ranging from 105 in the first five years, to the principal amount after July 31, 1968. Proceeds will be used to retire outstanding 6 per cent preferred stock amounting to $582,200, and for plant additions and replacements, general working capital, and acquisitions in related areas or investments in joint enterprises to strengthen the company's product lines.

For the four months ended April 30, 1959 net sales were $11,122,321, and net income was $331,429 equal, after preferred dividends, to 77 cents per share of common stock outstanding. This compares with $11,261,437 and $299,391, or 69 cents per share of

common, for the corresponding period of 1958.

Capitalization as of May 19, 1959 and adjusted to give effect to the issuance of the new debentures and retirement of Series B preferred stock, consists of $9,625,000 of debt, 38,450 shares of Series C preferred stock of $50 par, 258,128 shares of class A common and 120,000 shares of class B common stocks.

Feldman to Succeed Powers

Dr. Edward G. Feldman, Director of the Division of Chemistry of the American Dental Association, has been elected by the Council of the American Pharmaceutical Association to succed Dr. Justin L. Powers, who will retire late in 1960, as Chairman of the Committee on National Formulary and Director of Revision of N. F., and Editor of the Scientific Edition of the Journal of the A.Ph.A., and of Drug Standards. When Dr. Feldman joins the A.Ph.A. staff this Fall, however, he will be associate to Dr. Powers in these duties and will not assume full responsibility until after Dr. Powers' departure. Dr. Feldman received his Ph.D. degree in Pharmaceutical Chemistry and biochemistry from the University of Wisconsin in 1955.

Japan Upjohn Limited

Japan Upjohn Limited, a jointly owned company of The Upjohn Company, and Sumitomo Chemical Company, Osaka, Japan, will manufacture and market Upjohn products in Japan. It will be known in Japan as Nihon-Upjohn Kabushiki Kaisha. Norman C. Root, of Upjohn International Operations, Inc., has been named vice-president and general manager of the company. President is T. Nishikawa of Sumitomo Chemical Company.

"It's a Shabby Trick

Under the heading of It's a Shabby Trick, the July 20 issue of the NWDA Newsletter said: "One major producer of vitamins cut his package count from 100 to 90 . . . another large supplier of a popular mouth wash introduced a new package and cut the contents from 16 oz. to 14 oz. These are not isolated cases, but most firms who decide to 'vote themselves additional profit' generally make some reference to the charge or place on the package "New Package Adopted—." This protects the pharmacist who is attacked by the consumer by selling less for the same money. Pharmacists need and deserve this protection—to do less is unethical."

Legal Aspects of Medical Research

The report of the National Conference on the Legal Environment of Medical Science, May 27-28, 1959 may be purchased from the National Society for Medical Research, 920 S. Michigan Blvd., Chicago 5, Ill., for $2.50 per copy.

The 114-page report contains the papers presented at the Conference, and summaries of discussions and reports of the three main sessions: Clinical Research, Animal Experimentation, and the Use of Cadavers. It also contains the Nuremberg Code of Ethics in Medical Research, the American Hospital Association statement on Use of Investigational Drugs in Hospitals, the American Medical Association Consent to Operation form, and several state statutes in this general field. Of particular interest to the pharmaceutical industry are the following committee reports, which came from the session on Clinical Research:

(1) Reevaluation of the Nuremberg Code of Ethics—several changes in the Code were recommended.

(2) Legal Battery and Clinical Research: "Clinical research does not differ, on a responsibility level, from the normal practice of medicine:

"1. No legislation is indicated to regulate investigative procedures because there are sufficient codes of ethical practice in the medical profession (Nuremberg—local societies, etc.). A legal code would give rise to so many interpretative complications as to possibly inhibit ethically—legitimate research. The physician is warned that many insurance policies will not cover intentional legal battery in an investigative procedure.

"The Committee agreed to the following practices:

"1. The advantage to be derived by the public, if considerable, justifies a procedure which carries slight risk or remote danger, provided there be no safer route to acquiring the information. The judgment involved in this should be left to experts in clinical research.

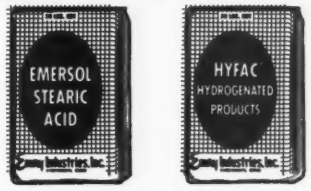
"2. Consent should ordinarily be obtained for all procedures, where practicable. (The definitions of 'ordinary' and 'practicable' were not agreed upon.)

"3. The public should be better informed as to the true nature of acceptable clinical research."

(3) Norms for Testing New Drugs in Human Subjects:

"1. The evaluation of most drugs, devices and techniques may be carried out completely within the physician-patient relationship as generally understood. In this relationship, the physician has always employed what he believes to be the best available treatment or preventive measure for his patient. When no known therapeutic or prophylactic measure has proved effective either against the disease or for his particular patient, the physician may employ a new measure that offers reasonable promise of success without undue risk to the patient, bearing in mind the severity of the patient's condition. When a therapeutic or preventive measure of some known effectiveness exists, the physician may employ a new measure that offers reasonable promise of significant advantage over the known measures without presenting undue risk to the patient. The physician must bear in mind not only the patient's condition but also the risks attendant upon the use of the known measure as well as those attendent upon withholding the

Emery ships



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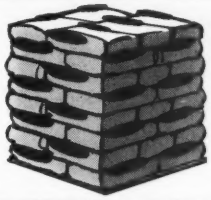

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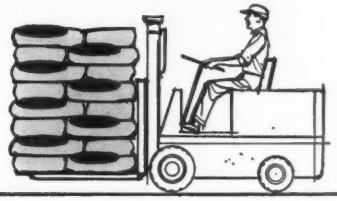

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known measure.

"2. When the evaluation of a new measure falls outside the classic physician-patient relationship previously discussed, the medical investigator is bound by the code of ethics governing human experimentation.

"Public health investigations involve the same principles, but there are different methods of implementation."

Prescription Volume to Double

Prescription drug volume shows promise of increasing two-fold in the next ten years and nearly threefold in fifteen years, according to Charles C. Rabe, manager of professional relations for J. B. Roerig Division of Chas. Pfizer & Co. Even with a slight to moderate increase in the number of pharmacies in the years to come, there will be significant gains for pharmacists who stand ready and able to render A-1 professional service, he said. Standing behind the pharmacist will be the pharmaceutical manufacturers' research appropriations which this year will amount to more than $190 million, he said, an amount which figures out to about $3,500 per pharmacy per year.

Merck Outlook

While Merck & Co. sales increased about nine per cent to $110,787,000 during the first half of 1959, and net income rose about 13 per cent to $15,847,000 for the period, company president John T. Connor said that similar results may not be achieved for the rest of the year because the "intensely competitive situation" may prevent the company from equaling the relatively high performance reached during the second half of 1958.

The Diuril family of drugs for high blood pressure and heart disease continued to win wide medical acceptance. Sales of Diupres and HydroDiuril, two new members of the group, increased substantially during the first half. Mr. Connor said that while vitamins, antibiotics, and vaccines remain a major source of the company's revenue, sales and profits of these groups were hampered in the first half by weakening prices and/or lower demand.

Among vaccines, Tetravax, a new combination product for prevention of polio, tetanus, diphtheria, and whooping cough, has been favorably received by doctors.

Merck Making Sabin Live Vaccine

Merck & Co. is beginning immediately a program of large-scale experimental production and further development of the Sabin oral vaccine designed to provide more than sufficient quantities to conduct extensive clinical testing to establish further the safety and efficacy of the Sabin live virus vaccine. The company is also accelerating Salk vaccine production to keep pace with current demand, and it is completing tests on a new, highly potent, purified polio vaccine of the Salk type. Merck president John T. Connor said:

"We are going ahead with the Sabin vaccine in recognition of our moral responsibility to continue our support of Dr. Sabin's efforts to fill the apparent public health need for a safe and effective polio vaccine that can be administered by mouth. In doing so we are fully conscious of the need for more clinical and other experimental data required by the National Institutes of Health. It would be unfortunate to release prematurely a vaccine that has so much potential for good but which might cause great harm if not properly controlled in every respect.

"Dr. Leroy E. Burney, Surgeon General of the U. S. Public Health Service, has made known what are the requirements which must be met before a live virus polio vaccine can be licensed: the vaccine must be effective against polio, it must be safe, it must be free of any contamination, and it must be capable of commercial production.

"Dr. Burney has also estimated that it will be sometime in 1961 before a live virus polio vaccine will be proved safe and effective and will be ready for distribution to the public.

More PMA Fellowships

Two additional Fellowships in clinical pharmacology have ben awarded by the Pharmaceutical Manufacturers Association to be administered at the University of Pennsylvania's School of Medicine. At the present time, the PMA is continuing a Fellowship (now in its third year) at the Johns Hopkins University School of Medicine. The PMA contributes $10,500 annually to the University of Pennsylvania, and the same to Johns Hopkins, to assist in financing these projects. The main purpose of these Fellowships is to train qualified investigators in the techniques of clinical investigation and drug evaluation.

Lilly Digest Facts

The Lilly Digest of Retail Pharmacy Operations for 1958 reports on 2,429 pharmacies (approximately 5 per cent of the nation's independently owned and operated stores) the largest sample in the 27 years of the Digest.

The 1958 summary of the pharmacies in the report indicates slight but continued improvement of gross margin. It averaged 34.7 per cent in 1958—an increase of 0.1 per cent of sales over 1957. Total expenses rose 0.4 per cent of sales; three-fourths of the increase was in the proprietor's salary and one-fourth in miscellaneous operating costs. Net profit, therefore, declined 0.3 per cent, but the total income (net profit plus proprietor's salary) remained unchanged at 13.2 per cent of total sales.

ALL ILLUSTRATIONS COURTESY LEDERLE LABORATORIES

Preparing a medium, for the multiplication of the weakened "seed" viruses, containing vitamins, amino acids, and salts, to nourish the monkey kidney cells, the living host in which seed polio viruses multiply.

ORAL POLIO VACCINE

A recent Washington Conference, as well as reports in the medical literature, emphasize current progress in the development of orally administered polio vaccines. Proponents—Cox, Sabin, Koprowski—expect large-scale immunizations to be easier, less expensive, more effective and longer lasting. Against this are the still inadequate field trials, which have not yet proved the expected reduction in polio incidence and the continuing fear that a live, attenuated polio virus might revert to a virulent form, capable of causing the disease it is designed to prevent. Moreover, the live virus spreads from the vaccinated to the unvaccinated, resulting in uncontrolled dissemination. This could, of course, be an advantage in a proved product, but presently requires further study and observation.

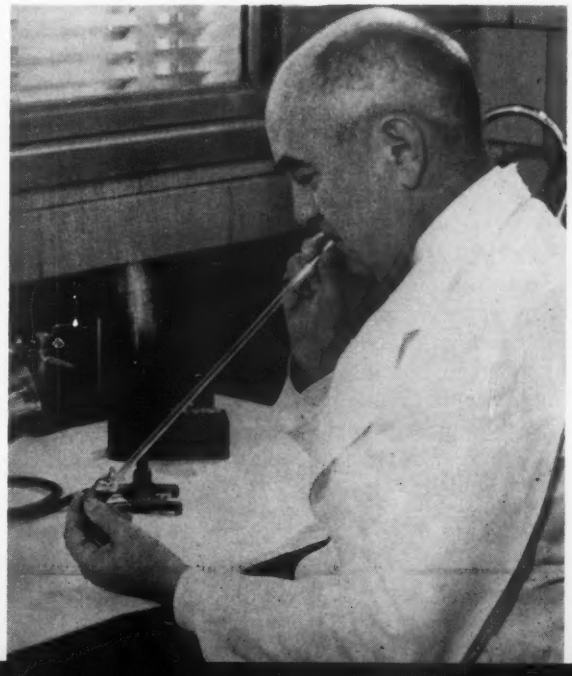
Despite the generally optimistic opinions expressed, U. S. Surgeon General Leroy E. Burney declared that on the basis of presently available scientific information, the Public Health Service would not now license the live vaccine. According to Dr. Burney, more controlled studies will be required. Trials to date have taken place in countries where the children normally develop natural immunity at an early age because of the widespread occurrence of the polio virus. One hazard is the safe transition from pilot to full-scale manufacture, which caused trouble in the early days of Salk vaccine production.

Lederle Laboratories, nevertheless, is planning new production and testing facilities for the Cox vaccine to enable production of up to 40 million doses of the trivalent vaccine each year.

The Salk Vaccine

The Salk vaccine consists of a mixture of the three strains of poliomyelitis virus now known to cause paralytic polio. These are grown on monkey kidney tissue and then treated with formaldehyde. The treatment kills the virus but leaves it still able to cause an immunologic reaction on injection, and confer immunity on the vaccinated subject. If the inactivating treatment is too intense, the protective power of the vaccine may be destroyed; if some of the virus escapes inactivation, it is capable of causing the disease. Current recommendations by the

One cc. of weakened seed virus is added to a Povitsky bottle containing monkey kidney cells in nutrient solution. After incubation for three days at 98.6° F., the seed virus multiplies to form the crude vaccine.



After meeting every requirement of the testing, the three-in-one vaccine is placed in individual dose vials. Ultra-violet lights in sealed cabinets insure against contamination. Production takes 120 days.

U. S. Public Health Service call for a series of four injections in all persons, including infants, under 40 years of age. The booster doses are "expected to increase antibody titers in persons in whom the antibody levels have fallen or in whom the initial antibody response was weak. . . ." Those vaccinated since 1955 with three injections have maintained a high degree of immunity, with the possibility of contracting the disease reduced on the average by 75 per cent.

Attenuated Vaccines

One form of the attenuated vaccine results from infection of a susceptible animal by the virulent strain and then continued reinfection of other species of animals that are not normally susceptible to the disease. This procedure eventually results in a modified virus that cannot cause the disease in human beings but is able to create antibodies and confer immunity when administered orally, the usual method of polio transmission. This immunity is expected to be of long duration, perhaps for life. According to presently available information, the three attenuated strains of the Sabin and Koporowski vaccines must be given at separated intervals because administration of one strain to develop antibodies prevents the development of antibodies by other strains given at the same time. The Cox vaccine, however, now successfully combines the three in one preparation to provide immunity to the three polio virus strains after a single dose.

At the conference sponsored by the World Health Organization and the Pan-American Health Organization, experts from 17 nations proclaimed the live virus vaccines safe, cheap, and effective and recommended their use internationally. The general concensus was that reversion of the weakened viruses to dangerous strains would not take place. No untoward results have thus far been reported from the vaccination of millions of persons.

The Sabin Vaccine

Dr. Albert Sabin told a Senate Government Operations subcommittee that more than six million persons in the Soviet Union had been vaccinated with his virus preparation. In addition, 200,000 children in Singapore, 143,000 children in Czechoslovakia, and 200,000 children in Mexico have been immunized. According to Dr. Sabin, the cost and dosage of his vaccine would be approximately one-hundredth that of the Salk vaccine. Application for licensing of the Sabin vaccine in the United States will be made on the basis of the results in Russia, if the tests are completed satisfactorily.

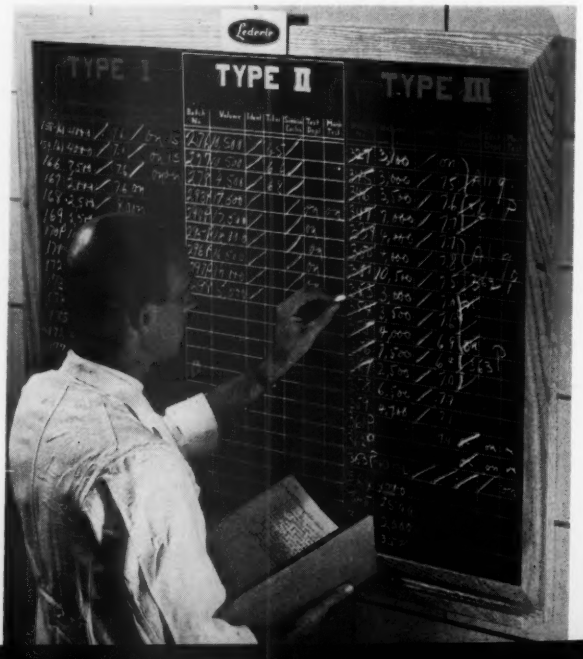
Large-scale use of Sabin Type 2 attenuated polio virus in Singapore, during a Type 1 poliomyelitis epidemic was described in detail in a paper in the June 20, 1959 issue of the *British Medical Journal* by J. H. Hale, M. Doraisingham, K. Kanagaratnam, K. W. Leong, and E. S. Monteiro.

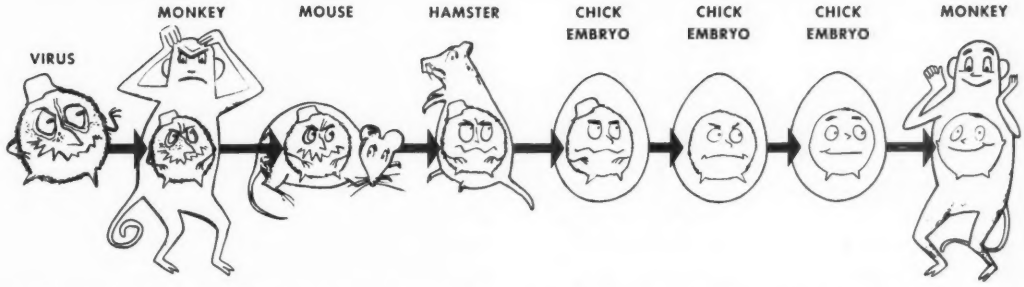
The second report of the World Health Organization Expert Committee on Poliomyelitis (1958) suggested that in the face of an impending epidemic or where poliomyelitis of the infantile type is endemic, especially where signs are indicative of an imminent shift to the epidemic form of the disease, a large-scale trial of attenuated vaccine might be attempted. Both these conditions existed in Singapore, and the Minister of Health decided to offer, on a purely voluntary basis, immunization with the attenuated poliomyelitis virus vaccine.

Although the epidemic was due to the Type 1 virus and all reported cases were shown to be infected with this serological type it was decided to use a vaccine of the Type 2 attenuated virus for the following reasons.

(1) Any large-scale use of attenuated virus vaccine at this stage should be such that it would be possible to arrive at a conclusion at the end of the trial regarding the safety of the vaccine not only

Scoreboard records the number, size, and final results of battery of safety tests for each batch of vaccine. Scoreboard is periodically photographed for permanent history of each batch of vaccine made.





One method of weakening a virus is to force the virulent natural strain to grow in hosts that are not its natural prey. Its adaptations to the hosts change its character, so that it can no longer cause polio, but can set off the mechanism producing immunity.

for the vaccinees but also their contacts who became secondarily infected. All cases of poliomyelitis that had occurred in Singapore since 1956 had been examined to establish the serological type of the virus responsible, and cases due to the Type 2 virus had not been found since June, 1956. As every case was examined by laboratory procedures, any due to the Type 2 virus would have been spotted immediately in this Type 1 epidemic. Had Type 2 cases occurred they would have been assumed to result from the introduction of the vaccine strain into the population, especially had there been any significant number of such cases.

(2) Feeding of attenuated strains of all three types simultaneously in chimpanzees (Sabin, 1956) resulted in a complete suppression of multiplication of the Type 3 virus. It was hoped that children in whom the attenuated Type 2 strain was established would show this interference phenomenon if exposed to the Type 1 strain.

(3) Persons who have experienced poliomyelitis infection often show some heterologous protection against the other types. Vaccination would insure that all vaccinees had Type 2 antibodies and this heterotypic protection might be invoked.

(4) The large-scale use of the vaccine would result in dissemination of large quantities of attenuated virus throughout the community, and this virus could interfere with the natural transmission of the prevalent epidemic strain.

A virus of attenuated virulence to be used as a vaccine must give rise to no illness or upset in the person inoculated or infected with the material. The attenuated Type 2 poliovirus used in this instance was administered to 198,965 children between the ages of three months and ten years without causing any cases of paralytic poliomyelitis within the group. This finding demonstrates the safety of this vaccine for the vaccinee.

One of the great problems in the use of attenuated poliovirus vaccine is that of virus excretion by the susceptible person which often results in infection of contacts, and the danger is that a mutant virulent strain will arise. The vaccine strain used did, in fact, spread rapidly through the susceptible members of the community. Results showed some strains with slight increase in pathogenicity, but there was no evidence whatsoever that the alimentary tract was selective for this type of variant. Tests on strains isolated from contacts where the virus must have had at least one human passage gave the same picture of occasional increase in pathogenicity, but these strains showed no greater increase in pathogenicity than those obtained direct from vaccinees. It cannot be overemphasized that this increase in virulence is a laboratory measurement, using the extremely sensitive monkey-lumbar-spinal-cord neurones. Strains of greater virulence than that exhibited by excreted strains of this vaccine have been isolated from perfectly healthy children during interepidemic periods.

One case of paralytic poliomyelitis due to the Type 2 virus in a four-year-old child occurred in the twentieth week of the epidemic, nine weeks after starting vaccinations. It was an isolated case, and if it had resulted from infection by an excreted vaccine strain many more cases would have been expected. Although Type 2 virus had not been isolated from paralytic cases in Singapore since June, 1956, such cases were occurring in Malaya even at the time the Type 1 epidemic started in Singapore. At this time several strains of Type 2 poliovirus were isolated from healthy children of Johore Bahru (the neighboring town in Malaya separated from Singapore by the causeway). There seems little doubt that "wild" virulent strains were circulating in this area. It is therefore highly probable that the one case reported in Singapore resulted from infection with one of these "wild" strains.

The protection afforded by this Type 2 vaccine strain against the Type 1 epidemic strain is difficult to interpret, as vaccinations proceeded over a period of weeks and a proportion of the theoretically non-vaccinated population actually become vaccinated as the result of infection contracted from vaccinees. During the course of the epidemic six cases of paralytic poliomyelitis due to the Type 1 strain developed among 198,865 vaccinated children.

During the same period from the first week after the beginning of the vaccination campaign there were

(*Continued on page 246*)

FLAVORING PHARMACEUTICALS

BY KURT S. KONIGSBACHER, D.SC.
EVANS RESEARCH & DEVELOPMENT CORP.

Although drugs are sold because of their effectiveness rather than because of their taste, there are several reasons why flavoring plays an important role in oral drugs. Since the introduction of antibiotics, each pharmaceutical house has been trying to outdo the other in developing new drugs and creating greater appeal for their use. Many modern medicines are identical in composition as well as in benefits. Foresighted drug manufacturers realize that the population at large has become acutely flavor-conscious, particularly in regard to processed foods, and that consciously or subconsciously flavor influences preferences for specific brands. Thus, although incidental to drug effectiveness, flavor could no longer be ignored in the growing, increasingly competitive pharmaceutical field. Particularly in non-prescription drug items, flavoring is an added "plus" to sales promotional efforts.

Making drugs more palatable for children was the natural course taken by manufacturers in applying flavor to medicines. Pharmaceutical houses began producing chocolate, orange, and lemon aspirins, vitamin candies, and other flavored drugs to induce children to like their products. Promoting drugs through flavor appeal quickly extended to the population at large.

One problem confronting pharmaceutical manufacturers is the possibility that certain flavors may cause allergic reactions in some individuals. When such a case arises, the physician would be the one likely to make a choice from available standard drug compounds, identical in effect, or to specify his own flavoring, if any. However, the real task of selecting flavor is assumed primarily by the drug manufacturer and, since it is important to his business, the selection is by no means indiscriminate. If a poor choice is made, the consumer may associate his dislike of the covering flavor with the drug itself. Prior to the development of comparable substitutes, castor oil was frequently taken with lemon juice, orange juice, or beer. In spite of the combination, castor oil was still considered bad-tasting; consequently some people acquired a permanent aversion not only to castor oil, but also to the liquids with which it was taken.

Thus, drug manufacturers take special care in selecting flavors which will not endanger the appeal

COURTESY ELI LILLY & COMPANY

of their products. Since the advent of "miracle drugs" and other new drugs on the market, much has been done to determine the proper flavors to cover effectively the "off" taste in drugs. The use of expert sensory panels has probably been the most effective means of determining how efficient flavors are and to what extent they actually cover off-flavors in drugs. What makes the contributions of expert sensory panels even more vital is the fact that the flavoring process is still more of an *art*, than a science. There are few set rules; much depends upon flavor experience. It is important, then, that members serving on sensory panels be experiencd in detecting taste and odor and in determining the extent of their effectiveness.

To understand the function of the sensory panel and some of the difficulties involved in flavor evaluation, one must know the definition of flavor. Flavor is essentially a mixture of sensations of our nervous system, perceived by our senses of smell, taste, and touch.

The mechanism of odor perception is really amazing—the number of odors that can be differentiated is practically unlimited. Odor experience is necessary to discover at what minimum concentration an odor can be perceived, and experimentation and scientific analysis show that the odor of certain compounds can be perceived in concentrations as low as one part in 40 or 50 million. However, the process is complex,

and measurements are sometimes difficult to obtain.

The physiology of taste is better established. There are only four basic tastes: sweet, sour, bitter, and salty. The tongue has specific receptors for each taste, arranged in a definite pattern.

However, the taste picture becomes complicated in that different people respond in a different manner to the same taste stimuli. This factor also imposes the necessity of carefully determining proper taste responses in individuals who make up an "expert" sensory panel for correct flavor analysis. Some of the factors governing taste performance and influencing the response to flavor stimuli are: environment and heredity (to the largest extent), climate, age, frame of mind, thought association, stress, and physical health.

Even after an expert sensory panel is established, there are problems in determining the best covering flavor or flavors for drug products. One important barrier is the difficulty of inducing individuals to taste drug components.

This factor coupled with the difficult task assigned to flavors in pharmaceuticals, that is, to cover undesirable flavor in drugs, makes successful evaluation a rather complicated process. In evaluation, success is measured by determining how *little* of the off-flavor is left. In every analysis, one should emphasize that it is less important to end up with a balanced flavor than to cover up, as successfully as possible, the off-flavor of the drug.

COURTESY LEDERLE LABORATORIES

Certain tastes are very difficult to cover, and some cannot be covered at all. The most difficult to cover are bitter and metallic tastes, which are particularly prominent in antihistamines. Two of the most effective and widely used covering agents are berries and chocolate. Some medicines are acidic, and some are basic, each requiring its own flavoring. Here are a few examples of frequently used drugs, and the compounded flavors generally used to make them more palatable:

Antibiotics
(Bitter taste requires sweetening agents.)

- Banana
- Banana vanilla
- Chocolate
- Citrus
- Maple
- Mint spice
- Orange mint
- Root beer
- Wild cherry

Antihistamines
("Stinging" sensation and metallic taste which is difficult to overcome.)

- Anise birch
- Anise mint
- Black currant
- Citrus
- Raspberry
- Rum peach
- Spice vanilla
- Sweet cherry
- Wild cherry

Barbiturates
(Usually elixirs; bitterness requires sweetness.)

- Anise citrus, mint or spice
- Black currant
- Cherry vanilla
- Lime
- Mint
- Orange concentrate
- Raspberry
- Root beer
- Spearmint
- Wine raspberry

Antacids
(Mostly powders or tablets. Surface exposure, a factor. Flavors used should be long-lasting.)

- Chocolate
- Mint anise
- Orange
- Peppermint
- Raspberry
- Spearmint
- Vanilla
- Wild cherry

While many schemes have been developed for the selection of covering agents for drugs, one point cannot be emphasized enough: successful evaluation depends on flavor experience, which demands taste experts. Major reasearch organizations, such as Evans Research, in New York City, have developed sensory panel techniques, which, used in conjunction with chemical and instrumental analysis, greatly speed the process of developing effective covering agents for modern medicines.

The sensory panel is primarily an analytical tool. Every precaution is taken to eliminate subjective influences in the testing procedure. Success depends entirely upon the objective judgmnt of the panel members. In the testing procedure, for instance, panel members are never asked, "Do you like raspberry?" but, instead, "How much raspberry do you taste?" The establishment of consumer preferences should not be attempted with a trained sensory panel. A pilot consumer panel would be more apt to produce information about preferences. In comparing products, the sensory panel is used to determine whether unfavorable characteristics are low and favorable characteristics high, or whether there are one or two outstanding off-flavors to be counteracted.

In the panel testing procedure, a list is made of the undesirable characteristics that are to be covered,

(*Continued on page 250*)

Cutting mawah plants in the White Highlands, Kenya Colony.

Charging a still with cut mawah plants in Kenya Colony.

ESSENTIAL OILS IN KENYA COLONY

BY ERNEST GUENTHER, PH.D. FRITZSCHE BROTHERS, INC.

In Kenya Colony the production of essential oils is small despite many efforts on the part of Government officials and pioneering growers; it remains confined only to oils of mawah and geranium—two *Pelargonium* species, or hybrids of doubtful origin—and oil of cedarwood, derived from *Juniperus procera.*

Oil of Mawah

The name mawah, or mauah, originates from the Swaheli term, maua, meaning flower. The plant was introduced probably by Dutch settlers from the Cape Province, where many *Pelagonium* species and varieties grow wild. Another version has it that it was brought in as an ornamental plant from India by Indian engineers engaged in the construction of the Uganda Railway. Whatever its origin, mawah (probably a hybrid of *Pelargonium graveolens* and *P. radula*) gradually developed into a local variety cultivated here and there in gardens of the Colony.

The essential oil derived from the mawah plant actually is a somewhat inferior type of geranium oil, with an odor slightly weaker and coarser than that of true geranium oil. It was first produced in 1926, creating some interest as an odorant of soaps. Production slowly rose to about four tons per year, most of it used in the United Kingdom. In 1939, the area under mawah covered 500 to 600 acres. During World War II, the bulk of the oil went to the United States, where it was used as a substitute for the then unavailable Reunion and Algerian geranium oils. However, production declined gradually in the late war years as a substantial part of the mawah acreage had to be converted to the growing of cereals. And when prices of the oil suffered a sharp decline in 1952, production was reduced to roughly one and one-half tons.

The plantations near Njoro, the only mawah-producing region in Kenya Colony, are located at an altitude of 7,000 feet, on decomposed volcanic soil (ashes), with an annual rainfall of about 33 inches.

Big game in Tanganyika, here, giraffe.

Elephants, also photographed in Tanganyika.

The heavier rainy season here lasts from the beginning of April to May, the lighter, July to August.

Planting is done via cuttings, first placed in nurseries at the beginning of the heavy rainy season, toward the end of March. After about two months in the nursery, that is, when they have become well rooted, the plantlets are set out into the field, at intervals of two feet, and in rows eight feet apart. A very annoying factor in the cultivation of the fields is infestation with couch grass, which impedes the growth of mawah bushes and greatly reduces the lifespan of a plantation.

In an established plantation there are two harvests per year, from March to April, and August to September. The first harvest takes place about four months after planting in the field, when the first flowers appear. Cutting is done with scissors (secitors). The plants must be harvested on sunny days, because on overcast or rainy days the yield of oil is abnormally low.

The freshly cut plants are distilled as soon as possible—a procedure peculiar to producers in this area; in most geranium-producing regions the plants are allowed to wilt in the fields after cutting.

The distillery near Njoro houses four metal stills, each holding about one ton of plant material. Steam pressure in the boiler is maintained at about 40 pounds per square inch, in the still at about two pounds. Distillation of one charge of fresh plant material requires about two hours, 40 minutes.

The yield of oil from green, that is, unwilted, plant material amounts to about 0.2 per cent (two pounds of oil per 1000 pounds of plant material). The yield of oil per acre and per cutting should average 15 pounds, but at the present time the figure is lower, due to the condition of the fields.

Obviously, growers in Njoro are anxious to increase production of the oil to several tons. Several hundred acres have been set aside for mawah, ample planting material is readily available and all producers are waiting for a substantial rise in the price of the oil.

Oil of Geranium

In addition to oil of mawah, Kenya Colony also produces a type of geranium oil similar to, but not quite as fine in odor as the Reunion and Algerian oils.

The establishment of the geranium plant (actually a variety of *Pelargonium graveolens*), from which this oil is distilled, was beset with many difficulties. In fact, it required more than ten years of painstaking experimentation, carried out by members of the Kenya Department of Agriculture and a number of pioneers among the growers in the White Highlands of the Colony. Many strains of geranium (*Pelargonium graveolens*) were tested, but only two varieties are now under cultivation (near Lumbwa, in the White Highlands). These are, first, the variety introduced more than 25 years ago by V. A. Beckley from the Royal Botanical Gardens, Kew, England.

The second variety was introduced just before the outbreak of World War II, from the Grasse region in Southern France to the Estate of Olkalola, Mount Meru, near Arusha, Tanganyika. (A large clump of the original plant still grows luxuriantly on this estate.)

Two other strains or varieties are now being experimented with near Lumbwa: a variety recently introduced from Reunion Island, which has heavily serrated leaves, mauve flowers, and a strong, characteristic geranium odor; and a variety with which the late V. A. Beckley was experimenting during his last years. This has roundish leaves and a very rosy odor reminiscent of citronellol.

However, the new varieties offer considerable difficulties in propagation, as rooted nursery plants cannot easily be transplanted to the field. Cuttings placed directly in the field require at least two months of favorable weather—not too cold—to take root, which conditions, unfortunately, rarely occur in the highlands of Kenya. However, a unique and low-priced method of planting has been devised recently; it seems to overcome these difficulties and there is good hope that in the future the variety can be propagated more successfully.

Successful cultivation of geranium in Kenya has ben handicapped by several factors, namely, the effects ofthe high altitude and rarified air, very cool

(*Continued on page 251*)

The crater of Mt. Kilimanjaro, Tanganyika, photographed from a plane.

And more big game in Tanganyika, here the rhinoceros.

MERCK'S PUBLIC RELATIONS

BY TED KLEIN PAUL KLEMTNER & COMPANY

Not too long ago a lead article in the *Newark News* stated, "A New Jersey company has been selected to be one of the first foreign agencies to start the fledgling republic of Thailand on its industrialization program . . . . John T. Connor, president, announced that his company has acquired a 7½-acre tract of land near Bankok, capital of Thailand, and will begin construction immediately of a drug plant."

In announcing the venture, Mr. Connor said "We feel quite strongly that if newly developing countries like Thailand are to make badly needed economic progress, they must have healthy people with a reasonable life expectancy. We hope—and believe—that the operations of Merck Sharp & Dohme (Thailand) will be a potent factor in achieving this goal in Thailand and the neighboring countries of Asia."

This gesture, a sincere one, typifies the sort of public relations which John Horan, director of public relations at Merck, and his management believe to be important today. In the two short years that Mr. Horan has held this position, such informed public relations have become more and more common.

He reports to John T. Connor as an important member of the management team that runs the firm. His department has grown rapidly in recent years, and is still growing. With an annual budget we estimate at about a million dollars (Sales, first 6 months 1959, up 9% to $110,787,000.) it is one of the largest such departments in the business. (Others as large or larger are at Pfizer, Smith Kline & French, and Lilly.) The responsibilities of the director include: the establishment of public relations policy, employee communications, government relations, stockholder relations, product publicity, professional relations, institutional public relations and advertising, corporate contributions, all company publications, plant tours, and PR services to all divisions.

Two statements from a recently adopted public relations policy sum up a general philosophy which Merck management has agreed is now official company policy. These are that the company will (1) "conduct our business with full regard for its importance to the public welfare and awareness of the deep and legitimate interest of the public in our affairs," and (2) "give to the public clear and accurate information on our company, its objectives, operations and accomplishments by (a) giving the public the freest possible access to information on the Company consistent with competitive security and the Company's legal and professional obligations, and (b) a positive program to bring facts about the Company to the attention of the public through the press and all other appropriate communications media."

JOHN HORAN

Merck is an outstanding company in the industry when it comes to producing high quality professional publications. They are expert in turning out books that for years have led the medical and chemical world in standards of accuracy and journalistic accomplishment. The *Merck Manual* is the largest selling medical book in the world today. There are few physicians educated since 1899, the year of the first edition, who have not used this compact volume, which is now in its 9th edition, to help them through their medical exams. Over 100 clinicians from this country and many foreign nations are its authors and consultants. This effort—a pure public relations tool, if ever there was one—is responsible that so many physicians-in-training hear of Merck before ever writing their first prescription.

In keeping with the technique of informed public relations, Merck does not take commercial advantage of the immense popularity of the *Manual;* they publish it on a strictly non-profit basis. Other Merck publications that are successful public relations ventures are: *The Merk Index*, *The Merck Veterinary Manual* and *The Merck Review*. The latter, a company house organ, is published six times a year for

the 11,500 or so Merck employees. Other company publications, each with its own editors and staff, are printed for workers in Rahway, in West Point, Pa., in Danville, Pa., and in Elkton, Va.

It is becoming increasingly important that corporate giving be part of the total company-image building process. Recognizing this, Merck's Horan has taken an active part in helping to decide to whom company money will be given for charitable purposes. A typical Merck attitude in giving is characterized by The Merck Company Foundation Cooperative Contribution Program. This is a recently created Merck idea to "stimulate and make more effective the gifts of Merck employees." The program provides matching funds for any educational institution to which a Merck employee may contribute.

Institutional public relations and publicity at Merck can take on a variety of forms. The recent past has seen a Merck Sharp & Dohme logo on a public service, open-circuit TV show originating at the A.M.A. Convention in Atlantic City. Viewers, as well as radio listeners, received a Merck program providing background information about this important medical meeting. The series was prepared to inform the public about medicine, not to sell Merck products, since it contained no product commercial of any sort.

Another public relations venture of institutional importance for the company is the continuing public talks of President John T. Connor. In June of 1958, he spoke to the Manufacturing Chemists' Association on "The Challenge of Soviet Progress in Medicine." Not a typical speaker, Connor's talk wasn't a typical review of hearsay about the Soviets. Instead, he gave the most penetrating and comprehensive analysis of Russian medicine assembled to that date.

The address was picked up by wire service newsmen and, in a matter of hours after he had spoken to a relatively small audience in White Sulphur Springs, millions of Americans read a full report of his message. Not only did he give an exhaustive report on Soviet medicine, he also presented a six-point program for the democratic West to follow in order to "win the race for a longer life." There was not a single message about Merck products, but those who heard or read it could have no doubt that Merck knows what it will take to win the race.

Horan believes "the speeches that Mr. Connor makes are important public relations contributions to our company. They make clear that Merck has a clearly developed sense of public responsibility, and in areas in which it has competence, such as medicine, our company will make whatever contributions it can to help solve important problems. It is our conviction that the soundest form of public relations is public service."

Connor really says something when he is invited to speak, and the resultant newspaper coverage is clear testimony to the research that goes into his talks.

Typical of this institutional coverage was a project paid for by Merck Sharp & Dohme Research Laboratories. It was a survey of the views about research of some leaders in the field. Those questioned included deans of medical schools, high government offi-

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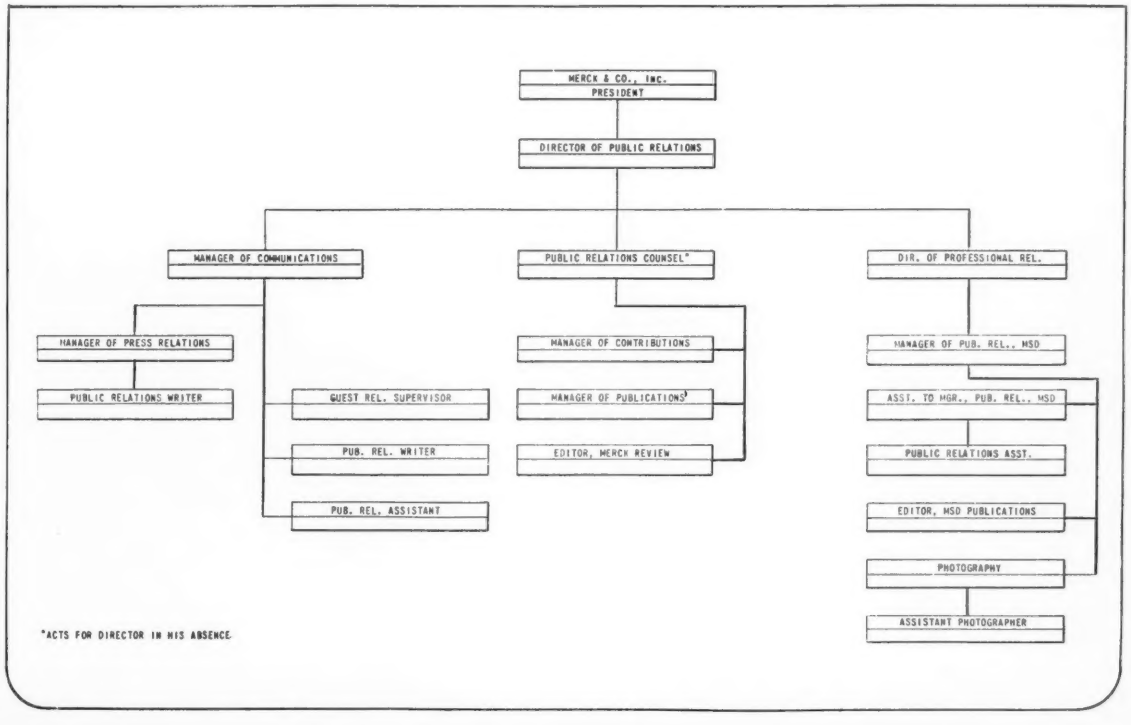
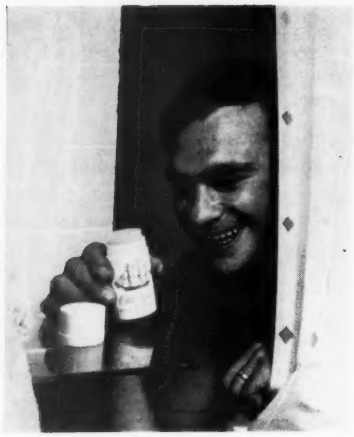




COURTESY SHULTON INC.

DEODORANTS AND ANTIPERSPIRANTS

BY JOSEPH KALISH, PH.D.

What is the market for deodorants and antiperspirants? It could be bigger. A reasonable estimate of present sales made by Bristol-Myers is that total purchases are now on the order of $85 million, of which about $25 million are of roll-on products. A little more digging among surveys, and an attempt to bring divergent estimates into line, permits the guess that approximately 90 per cent of women use deodorants and antiperspirants, while only 60 per cent of men use them. A simple arithmetical projection leads to the conclusion that retail sales could reach a total of $110 million, if men were as good customers as women. Even this figure does not represent a saturated market. Daily use of deodorants and antiperspirants is not necessarily the rule, nor is their use as nearly routine in colder months as during warm weather. Promotion of the use of these preparations, as well as emphasis on their types and brands, has to be profitable.

To continue these speculations, we tend to believe that about 60 per cent of the preparations sold are probably antiperspirants and 40 per cent deodorants; 32 per cent are creams, 32 per cent are roll-on packages, 20 per cent are liquids (including lotions and squeeze bottles), and 16 per cent are sticks. Soaps with deodorant action and claims are important, and increasingly so, but do not necessarily affect the market for cosmetic preparations. Incidentally, there is no pretense that these general guesses of the deodorant and antiperspirant market have any more validity than other guesses. They can serve only as a conversational guide, since a detailed and authoritative study is not available.

This volume of selling derives from the fact that the adult human body puts out betwen one and three pints of sweat every 24 hours, and this can be increased to as much as a quart an hour under extreme stress. Sweat and sweating are the heat regulating system of the body, moisture evaporation producing the necessary cooling. Sweating increases with a five degree rise in skin temperature or a 0.5 degree rise in blood temperature. The liquid is for the most part a dilute salt solution, lightly flavored with lactic acid; very little other organic material is present. Its *p*H ranges from 4.5 to 6 and will approach neutrality more closely as sweating becomes more profuse. A very small, localized proportion of sweat consists of the excretion of the apocrine glands, a milky fluid with an appreciable concentration of protein and carbohydrate material. The flow of liquid perspiration

COURTESY BRISTOL-MYERS

COURTESY HELENA RUBINSTEIN

over the skin surface also becomes more or less mixed with oily sebaceous secretion. The sweat components from eccrine and apocrine glands are reported to be odorless when first produced, as is the sebaceous secretion. The characteristic odor of sweat quickly develops, however, as a result of bacterial decomposition of the organic substances. Stresses will sometimes result in the sudden development of perspiration odor, apparently unconnected with bacterial action. All in all, however, preparations that depend upon the presence of an antibacterial preparation to maintain absence of odor are quite effective.

Sweat is excreted by an enormous number of eccrine glands distributed over almost the whole body surface and by a smaller number of apocrine glands concentrated in a few areas. The function of the eccrine gland, the heat regulator, is to flood the surface of the body with water, which cools the surface by evaporation. There are from 2 to 3 million of these small glands in the skin, about 600 to 1,200 per square inch on the average, with about 1,800 to the square inch on the forehead. The gland itself is of microscopic size and consists of a tube terminating at the skin surface and leading down to a coil deep in the lower skin layer. The openings of the eccrine sweat glands in the skin can be seen only as pores in the palms and the soles; elsewhere the tube openings are covered by a loose mesh of skin cells. Heat is the major stimulus for these glands, but they will also pour forth sweat when the nervous system reacts to pain, to fear, to anger, or to similar strong emotions. In these instances, sweat secretion will mainly appear on the palms and soles, the forehead and in the armpits. Eccrine glands are not active at all times, most being in a "resting" state. When activation occurs, as with heat or emotion, more glands come into action. The final volume of sweat is the result of very small production by a very large number of glands.

COURTESY CARTER PRODUCTS

Apocrine sweat glands no longer have any apparent function in human beings; in lower animals they appear to serve a protective function by producing a repelling odor. In animals, and perhaps in man, their secretion may participate in sexual attraction. These glands are relatively much larger than the eccrines, but also consist of a coiled tube with a straight portion leading up to the skin. The tube empties into the hair follicle just above the opening of a sebaceous gland. Apocrine glands produce their secretion continuously in small quantities and it is stored in the tube, to be discharged under suitable stimulation. This stimulation may be the emotions of pain or fear; heat is not a stimulus for apocrine secretion. Discharge of the gland contents results in inability to discharge again for a day or so until the gland has had a chance to be refilled. Apocrine glands are concentrated in the axillae, around the nipples, on the abdomen, and in the genital regions. Modified forms of the gland are found in the ear and on the eyelid; the mammary gland is considered to be a specialized form of the apocrine sweat gland.

A deodorant preparation is formulated to prevent the development of odor in the originally odorless sweat; it will not reduce the volume of perspiration. Reduction in the flow of perspiration is the intent of antiperspirants, and these preparations are also deodorants. Neither is intended as a substitute for frequent bathing.

Primarily, the active deodorant ingredient is antibacterial—to prevent bacterial decomposition of organic components of sweat. From the many germ-killers available, the choice for use on the skin should be made with care. Foremost, the compound must not be an irritant or sensitizer, since it is likely to be in contact with moist skin for long periods of time. Most commonly used are hexachlorophene, bithionol, trichlorocarbanilide, and tetramethylthiuram disulfide. These have been particularly effective in cake soaps, where requirements are somewhat different from those for cosmetic preparations. In deodorant cake soaps, the antibacterial must be active in the presence of the alkaline soap and also be substantive to the skin. This will assure the gradual accumulation of active concentrations of antibacterial agent on

(*Continued on page 265*)

ARTIFICIAL SWEETENING OF TABLETS

BY C. J. ENDICOTT AND H. M. GROSS, PH.D. ABBOTT LABORATORIES

Sucrose (cane sugar) in many forms has been a common adjuvant and excipient in the manufacture of tablets since medical adoption of this dosage form. Sugar has several basic disadvantages with respect to the preparation of tablets. These can be overcome through the use of artificial sweeteners. The disadvantages of sugar include:

(1) Sugar, as a sweetener, must be incorporated in amounts which add considerable bulk to the tablet.

(2) Sugar adds calories to the tablet. Although actually small in number, calories are definitely a sales disadvantage in a calorie conscious America. These carbohydrates are also of concern to the diabetic population.

(3) The hygroscopic nature of sugar leads to physical problems during aging and exposure to humid environment.

(4) Sugar impedes tablet disintegration if included in significant quantity. Present emphasis on disintegration and physiological availability[1-3] make this a significant disadvantage.

(5) Sugar caramelizes in the presence of heat. This is a disadvantage in pelleting of tablet granulations[4] and tableting drying processes employing heat.

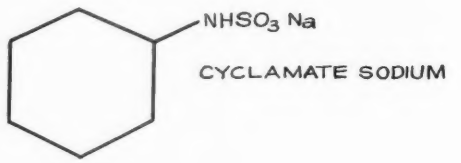
(6) Sugar often necessitates the addition of lubricant to tablet formulations. As little as 1 per cent magnesium stearate can add significantly to tablet disintegration time and cane sugar usually requires higher concentrations for satisfactory compression.

(7) Sugar is one of the responsible factors in the development of dental caries.[5] Tablets intended for buccal or sublingual use involving prolonged exposure in the oral cavity would offer an advantage if prepared without sugar.

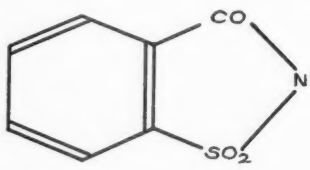
(8) Because of the chemical activity of sugar[6], incompatibilities may arise in the complex preparations presently being marketed by the drug industry.

The three chief uses for sugar in tableting are as a binder during the preparation of granulations, as the major constituent of tablet coatings, and as a sweetener.

The availability of chemical sweetners and the study of their inclusion in tablet formulations make it possible to replace sugar in many of its applications thus overcoming the disadvantages previously cited.



CYCLAMATE SODIUM



SACCHARIN SODIUM

Cyclamate (the sweetening agent or a component of sweetening agents marketed under the registered trademark Sucaryl by Abbott Laboratories) and saccharin are currently the only two non-nutritive sweeteners permitted by the Food and Drug Administration for use in foods, beverages, and drugs. Cyclamate was first described by Audrieth and Sveda[7] and along with saccharin has been reported by Lehman[8] to be substantially non-toxic. Saccharin was first prepared in 1879 by Remsen and Fahlberg.[9] Helgren, Lynch, and Kirchmeyer[10] demonstrated that the off-taste of saccharin is inherent in the saccharin molecule itself. Several authors[11-18] have noted and attempted to evaluate the saccharin off-taste. Vincent, Lynch, Pohley, Helgren, and Kirchmeyer[19] illustrated the potentiation of sweetness when cyclamate sodium and saccharin sodium are combined in preferred ratios. A ratio at ten parts cyclamate to one of saccharin is an example. These ratios also minimize the saccharin off-taste. In the ensuing discussion, these relations of cyclamate to saccharin have been maintained.

The non-nutritive sweeteners are offered as several entities. These include a granular or powdered form. They can be obtained as the acid form, the sodium salt, or the calcium salt. Each form has utilization in specific tableting problems.

Cyclamate and saccharin have general advantages that make them more desirable than sugar in tablet formulations. The most obvious advantage is the elimination of calories. Any tablet formulated with artificial sweeteners has this sales advantage. Amounts of cyclamate and saccharin necessary to obtain product sweetness equivalent to sugar can be

incorporated into a tablet without significantly adding bulk. Tablets prepared with cyclamate and saccharin disintegrate quickly. Drug release is not dependent upon the slow solubility of sugar in compressed form.

Sugar has been used extensively in candy-like preparations intended to be chewed or to be dissolved in the mouth. Drugs incorporated into this type of preparation include vitamins, minerals, antibiotics, sulfas, analgesics, antipyretics, and antitussives. These medicaments have a variety of inherently peculiar tastes. Each one is a specific flavoring problem. Cyclamate-saccharin combinations can be used to overcome many of the medicinal off-tastes encountered. When combined with appropriate flavors and scents, these sweeteners can be organoleptically stimulating and provide pleasant medication. The sodium salts of cyclamate and saccharin may be used to cover tastes which occur immediately upon contact with the tongue or mucous membranes. The acid form is slowly soluble and should be used to cover after-tastes imparted by medicinals. The ultimate preparation for use would incorporate the sodium salts of the sweeteners to give an immediate sensation of sweetness and a related amount of the acid form for later salivary solubilization to cover lingering after-tastes. Formulations including 2 per cent cyclamate sodium and 0.2 per cent saccharin along with 0.5 per cent of cyclamate acid and 0.05 per cent saccharin acid have been proven successful in experimental studies. A predominance of the acid form will also provide a tartness which may be desirable to enhance fruit flavors and mask undesirable tastes.

As previously stated, artificial sweeteners have an advantage in that they do not contribute to dental caries. This has therapeutic advantage for drugs administered sublingually.

Tablets marketed as anorectic preparations to treat obesity should include artificial sweeteners to satisfy the hunger for sweetness. Cyclamate and saccharin satisfy sweetness hunger without adding caloric content to the medication, treatment or diet.

Cyclamate acid can be used with considerable success as an effervescing agent. It provides the acid portion of the reaction with a carbonate to aid tablet dissolution and carbonation. It is a relatively strong acid and reacts well. A suggested formula for tablets which disintegrate in water in less than one minute is given below:

Formula for 1000 tablets

Medicinal	24.7 gm.
Cyclamate acid	22.2 gm.
Saccharin sodium	6.0 gm.
Acacia powder	2.7 gm.
Sodium bicarbonate	10.4 gm.
Polyethylene glycol 6000	2.7 gm.
Distilled water	10.0 ml.

Mix the active ingredient, cyclomate acid, saccharin sodium, and acacia powder and blend well. Mass the powders with water. Pass the mass through a 4-mesh screen to granulate. Dry the granulation at 50° C. for 24 hours. Pass the dried granulation through a 20-mesh screen. Pass the sodium bicarbonate and polyethylene glycol 6000 through a 40-mesh screen into main granulation. Blend. Compress into tablets.

Cyclamate acid as an effervescent eliminates tablet bulk and off-tastes inherent in other acids, and also imparts to the preparation a pleasing mildly sweet taste.

Tablet coatings are another area of possible product improvement through the use of artificial sweeteners. Since the inception of pills and tablets as a dosage form, sugar has been used to impart taste acceptability. Recently new coatings of a very thin nature and usually composed of materials other than sugar have been introduced into the drug field. These are generally referred to as film coatings for tablets. Ahsan[20] *et al.* reported on a film consisting of polyvinylpyrrolidone and monoglycerides. Several authors[22, 23] have advocated films consisting of polyethylene glycols. Winters and associates[24, 25] have published formulations utilizing zein as the film former for tablet coatings. Doerr[21] has also discussed sugar-free coatings. Several major companies have marketed products with film-type coatings. Most of these coatings are of a bland, non-suggestive taste which add very little to the flavor appeal of the products. Artificial sweeteners impart sweetness to the new coatings. Films cannot include sugar in the nonaqueous systems because of the large quantities required for sweetness but as little as 3 per cent w/w cyclamate and 0.3 per cent w/w saccharin added to the film solutions imparts a sweet taste comparable to sugar-coated tablets. The sweeteners can be dissolved in the coating solution, if soluble, or can be dispersed or suspended in the solution similar to the dispersion

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X-RAY ANALYSIS OF PHARMACEUTICALS

BY VERN W. PALEN PHILIPS ELECTRONICS, INC.

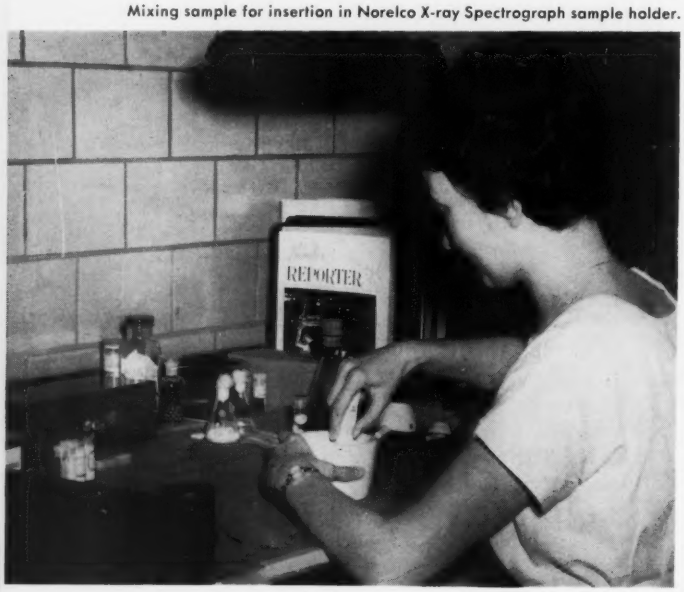
Parke-Davis & Company solves many key problems by means of X rays. This work is handled by R. Bruce Scott, research chemist in the group with Dr. J. M. Vandenbelt, laboratory director in physical chemistry. The X-ray studies and various other analytical procedures receive over-all guidance from Dr. Leon A. Sweet, vice-president and director of research, Dr. Loren M. Long, director of chemical research, and Dr. Harry M. Crooks, assistant director of chemical research.

For instrumentation, the company employs a complete X-ray camera-diffractometer, spectrograph installation. Some problems are solved by diffraction using film techniques. Other tasks are handled with the goniometer-counter set-up in order to obtain accurate answers on a strip-chart in a matter of minutes.

X-ray methods have been used recently to check: the zinc content of rubber closures in connection with the precipitation of a diphtheria-tetanus toxoid preparation, the iron content of various clays used for thickening agents, selenium assay in steroid preparations, mercury for determination of merthiolate content of a protein preparation, the Ambodryl content of cough syrup based on assay of organic bromine in the molecule, the hyoscine (hydrobromide) in Benacine (for motion sickness), hydrogenation and high pressure reactions on catalysts (palladium, rhodium and platinum), iron oxide for correct form in a vitamin preparation, and identity and quantitative data on inert forms in a biologically active antibiotic (Chloromycetin).

Adjusting the goniometer for X-ray intensity readings of an element.

Mixing sample for insertion in Norelco X-ray Spectrograph sample holder.



The problem of checking the zinc content of rubber closures involved a precipitate that was appearing in a preparation before final inspection. The X-ray Spectrograph indicated that zinc was present in the precipitate. This led to an investigation of the stoppers, since zinc is often used in rubber compounding. This theory was quickly confirmed by analyzing the stoppers directly with X rays. When they were placed in the sample holder, the instrument identified zinc immediately. Obviously, the precipitation in the preparation was caused by zinc that was leached out of the rubber stoppers. The problem was quickly eliminated by changing closure specifications with respect to zinc content.

The second problem arose during a special research project when it was necessary to measure the iron content of various clays that are used for thickening agents in liquid preparations. The product development department found that some of the clays were not giving the proper results and wanted to know why. Iron was the suspected culprit, but was quickly exonerated after an assay was made with the X-ray Spectrograph.

The study of steroids is an area in which Parke-Davis has a great interest, because these products are widely used in treating arthritis as well as numerous

other physiological conditions. In connection with a recent product, a selenium compound was used in the manufacturing process, and it was necessary to ensure that all selenium had been removed. When the question was raised whether the X-ray equipment could confirm the presence or absence of selenium, the X-ray laboratory reported that they should be able to make such assurance. In five minutes after delivery of a research sample, without any previous experience with this element, the laboratory had the answer. The chart showed a peak that proved without a doubt that selenium was present in a significant amount. This selenium is a residue from a catalytic step used in the sterol manufacturing process. Selenium cannot be tolerated in drugs except in very small amounts because of its physical characteristics. Strict specifications have been set up and all shipments are checked with X-ray methods to make sure they comply with requirements.

Concerning merthiolate, a mercury-containing preservative used in protein preparation, it is necessary to know whether the merthiolate is retained through all steps of processing. This is done by analyzing for mercury in the final product. Since the mercury is present in very small amounts (one part in 20,000) this is normally a difficult assay. The task is relatively simple with the X-ray method.

The element bromine was used in X-ray assays to check the ambodryl content of cough syrup. Perhaps a more interesting use of bromine is that which concerns Benacine, a preparation for control of motion sickness, comprising Benadryl hydrochloride in a concentration of 100 parts, the alkaloid hyoscine hydrobromide in a concentration of one part, and inert compounding materials.

All drugs made from standard quality lots are required by law to have each active constituent assayed after the material is compounded. Controls extend over every step of manufacturing, beginning with weighing of materials, grinding, sifting, mixing, and blending. Every step must be checked by qualified, independent observers and the number of capsules or tablets produced must agree fairly well with the expected number calculated from the weight of material put into the machine. After taking all of these precautions aimed at nullifying human error, every drug must be assayed for all important components before it can be OK'd, delivered, shipped, put on the market, or let out of the plant.

The motion-sickness preparation was delayed while an assay was attempted to determine the small amount of hyoscine in the presence of 100 times as much Benadryl. It was possible to analyze for halide conventionally, but the predominance of chloride was so great that the assay was meaningless for a very small percentage of bromide. The laboratory worked out an assay for the hydrobromide using infrared analysis. The method was adequate and reasonably precise, but before the infrared technique was published and put into practice, the X-ray instrument was installed. Immediately, the bromide was assayed directly for bromine by using the crushed tablets in the X-ray sample holder. The method was more precise, convenient, and faster than the infrared procedure, and therefore was adopted.

Similar assays using the element bromine are also carried out by Parke-Davis. To go back to the cough syrup, it contains five effective components of which one is Ambodryl (*para*-bromo Benadryl hydrochloride). In this case also, the assay for Ambodryl would be very difficult by any other method than with X rays.

Another problem deals with the three elements palladium, rhodium, and platinum. In this instance, the X-ray laboratory has been able to provide valuable assistance to research chemists who work with high-pressure catalysts. For studying the composition of hydrogenation and high pressure catalysts, the X-ray technique has again provided rapid, accurate results.

An iron assay project using X rays concerned a vitamin product containing available iron which had to be in the yellow oxide (alpha) form. Other forms of iron oxide have a strongly catalytic effect on the breakdown of absorbic acid (vitamin C component). Thus, it was necessary to distinguish the alpha form, which laboratory work had shown to be biologically effective. The control for this assay was X-ray diffraction, since alpha and gamma forms of iron oxide produce distinctly different patterns. After the vitamin preparation is compounded, the X-ray Spectrograph is employed again in assaying the final product.

A notable application of the X-ray technique involves identification and quantitative determinations of an inactive form in an antibiotic (Chloromycetin). Parke-Davis first produced this drug by fermenta-

(*Continued on page 256*)

Examining an X-ray diffraction film to identify drug mixture's pattern.

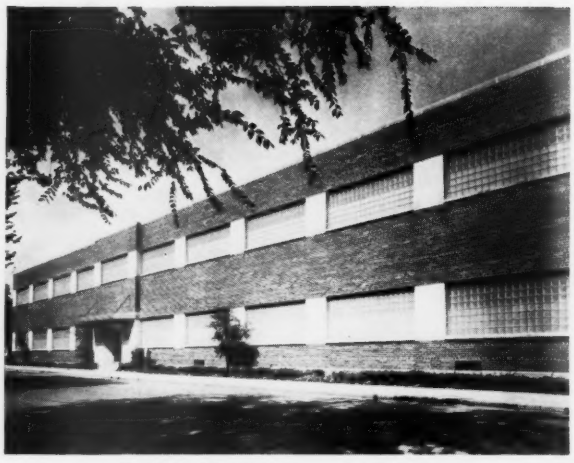
MILES LABORATORIES RESEARCH

The structure of research operations of Miles Laboratories, Inc. has been reorganized into staff and operational functions, but with considerable coordination among the groups. Total research costs in 1958 were about $2 million, representing about 3 per cent of total sales, 3.7 per cent of domestic sales. A new research center, at a cost of about $1.5 million, has been authorized.

The corporate or central research activities are under the direction of Dr. Walter A. Compton, Vice-president for research and medical affairs, reporting to Walter R. Beardsley, President of Miles Laboratories, Inc. Reporting directly to Dr. Compton are the Director of Research, Dr. Lathan A. Crandall, Jr.; Medical Director, Dr. Raymond L. Conklin; Director of Research Coordination, Richard S. Nicholls; Director of the Chemical Therapeutic Research Laboratory, Dr. Otis E. Fancher; Director of the Medical Sciences Research Laboratory, Dr. Robert K. S. Lim; Director of the Pharmacy Research Laboratory, Dale E. Fonner; Librarian in charge of the Department of Libraries, Mrs. Philip J. Mitchell.

In divisional research, the Vice-President for Research and Medical Affairs, Dr. Kenneth Carter, reports to the President of the Ames Co. and reporting to Dr. Carter are the Medical Director, Dr. Norman L. Heminway, and the Director of the Ames Research Laboratory, Dr. Alfred H. Free. Dr. Dorothy L. Carter is the Research and Medical Director of the Miles Products Division, reporting to Lewis F. Bonham, President of the Division. Dr. Willard J. Croxall is Coordinator of Research and Development, reporting to Howard F. Roderick, President of the Chemical Division. Reporting to Dr. Croxall are the Director of the Chemistry Research Laboratory, Dr. John Mirza; the Director of the Biosynthesis Research Laboratory, Dr. Leonard B. Schweiger; and the Director of the Enzymology Research Laboratory, Dr. Leland A. Underkofler.

The divisional research and medical department heads are responsible to their respective divisional presidents, which permits each division to assume direct management of day-to-day operation of product development activities. Nevertheless, a very important functional relationship also exists with the Vice-President in charge of research and medical affairs for the parent company, Dr. Compton, and this provides cohesion for the research efforts of the corporation as a whole.



The Miles Laboratories research building.

The central research effort also includes coordinating and advising all laboratories, including divisional staffs, maintaining liaison and promoting collaboration; coordinating policy, budgets, and communications. The central laboratories will also directly participate with the divisions in certain phases of research. At the same time, by developing interdivisional communication and corporate policy objectives, all members of the scientific staffs of the divisions and of the parent corporation become intercommunicating members of the single scientific staff.

A newly created coordinating and advising body for research and medical matters has been formed. It is called the Scientific Council and is composed of two parts—a Senior Council and an Associate Council. The Senior Council devotes its attention to research and medical matters of corporate scope. The Associate Council assists the Senior Council and also advises upon and coordinates policies affecting all laboratories.

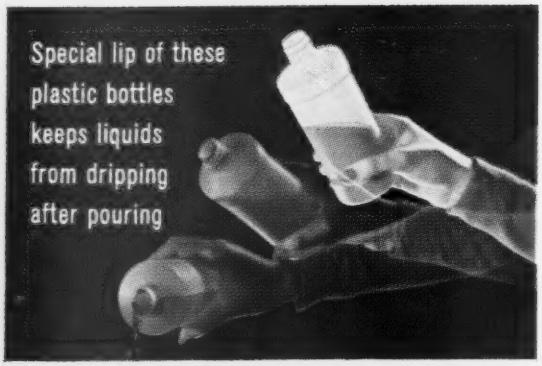
Over-all, the Miles Laboratories research program seems to be divided into shorter range, specific projects handled by the divisions with broader, long range efforts concentrated in the central group. This should permit "basic" research operation without distractions caused by day-by-day development needs. At the same time, the central group coordinates divisional research with the over-all company plan and is available for consultation and advice. Finally, still closer coordination can be accomplished by means of the Scientific Council is setting over-all policy and promoting communication.

The company also has a program to take advan-

(*Continued on page 263*)

Packaging and Selling

Rezifilm, surgical spray dressing
for pre-operative and post-operative use to prevent infection, from E. R. Squibb & Sons. Surgical incisions may be made directly through the film. Available in two-ounce aerosol dispenser cans, Rezifilm is also useful as a dressing for minor cuts, abrasions, and bruises.



New type of plastic bottle by Owens-Illinois is feather-light, rugged, versatile, economical

The semi-rigid blown plastic bottles shown here are a few of the shapes, sizes and colors possible with this new Owens-Illinois process.

Semi-rigid blown plastic containers are extremely lightweight, durable, and easy to handle . . . both on your filling line and in consumer use. The special lip prevents liquids from dripping after pouring.

Yet with all these packaging and merchandising advantages, Owens-Illinois rigid blown plastic containers are low in cost . . . compare favorably with most other packages.

Find out how these containers can help you . . . call the Owens-Illinois sales office nearest you.

PLASTIC CONTAINERS
AN (I) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO

YOUR MARKET IN 1959 AND IN THE YEARS AHEAD*

BY JAMES O. PECKHAM A. C. NIELSEN COMPANY

A review of the marketing of health and beauty care products through drug and food stores can best begin with a look at Chart 1, which shows total drug store sales in the top line, total food store sales in the middle line, and the consumer disposable income, which is what we consumers collectively have left after we get through paying our taxes. In each instance, the figures for the year 1952 have been set at an index of 100.

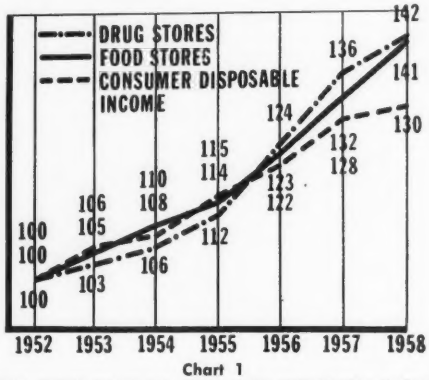


Chart 1
TOTAL STORE SALES VS. CONSUMER DISPOSABLE INCOME

You may be surprised at the closeness of the horse race that has been going on over the past six years between drug and food stores. Sales for the year 1958 are up 42 per cent over 1952 for drug stores and up 41 per cent for food stores—practically a dead heat or at least a photo finish. Contrary to opinions expressed in some quarters, the drug store seems to be more than holding its own despite the preference of many consumers for buying their health and personal care items in food stores. Drug stores, of course, are more and more turning to self-service or at least self-selection, newer and larger stores, shopping center locations, and are also doing an increasingly large volume of business in prescription items.

Note the similarity of trend between consumer disposable income, on the one hand, and retail drug and retail food store sales, on the other, particularly through 1956. Since that time, sales gains in retail drug and food stores have far outstripped gains in consumer income, particularly in 1958. While we've always known that these fields were stable, it is gratifying to note that the virtual leveling of consumer income in 1958 was *not* accompanied by corresponding trends in drug and food store sales—unlike the situation that existed in 1949 and again in 1954.

Now look a little closer at our own sphere, the health and beauty aid business with our retail customers. Chart 2 covers the consumer sales of 20 complete product groups such as headache remedies, dentifrice, laxatives, shampoos, chest rubs, deodorants, and oral antiseptics—the more popular products generally.

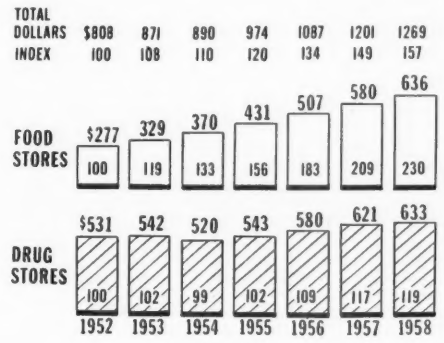


Chart 2
TOTAL SALES OF 20 PRODUCT GROUPS IN MILLIONS OF DOLLARS

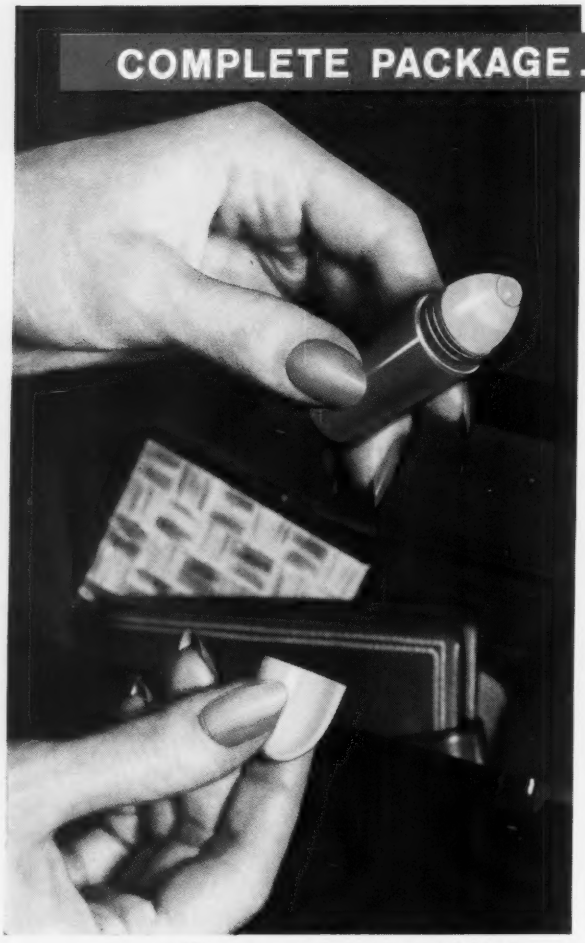
Note that (1) total sales of the 20 product groups in food and drug stores combined are up 57 per cent since 1952, as compared with the smaller gains of 41 per cent and 42 per cent for *total* store sales; and (2) while food store sales have increased a whopping 130 per cent over 1952 levels, drug store sales have also increased—the 19 per cent gain being equivalent to an increase of 100 million dollars in annual sales for these 20 product groups alone.

The trend of the relative importance between drug and food stores for these specific items is better seen on Chart (p. 258) which shows how purchases of health and beauty aids are divided between drug and food stores. You will note that in 1952 the drug store accounted for two-thirds of the sales in the 20 product groups; in 1958 this had been reduced to 50 per cent, despite the 19 per cent gain in actual drug store sales of these products.

That the 50 per cent share of business obtained by food stores is not the same for each individual product group is shown on Chart 4, which indicates that the

(*Continued on page 257*)

*Abstracted from an address before the Proprietary Association, May 1959.



Owens-Illinois has recently developed this bullet-type miniature ball-applicator package.

Owens-Illinois provides ball applicators for every type of product dispensed in such packages.

Owens-Illinois supplies your ball-applicator package needs

IF YOUR PRODUCT can be dispensed in a ball applicator, you can profit from the design and production experience at Owens-Illinois. For countless products from deodorants and other lotions to certain food products, Owens-Illinois has produced the "just-right" ball applicator.

Take the new bullet-type miniature applicator package recently developed by Owens-Illinois. It's perfect for a woman's purse or man's pocket, as a package for perfumes, lotions, deodorants, and even certain skin medications.

This small, carry-with-you ball-applicator package is just one of the many developments by Owens-Illinois in this fast-growing field—just one of the reasons why it's best to see Owens-Illinois when you want the finest packaging.

There's an Owens-Illinois office near you, or you can write for full information to Owens-Illinois, Toledo 1, Ohio.

PRESSED PLASTICS
AN (I) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES • TOLEDO 1, OHIO

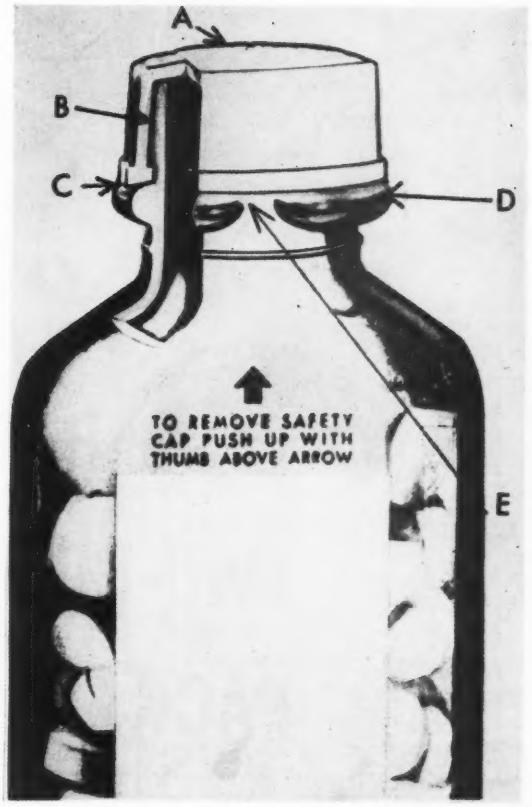
SAFETY CLOSURE CAPS*

BY JAY M. ARENA, M.D. DURHAM, N.C.

The accidental ingestion of drugs causes 35 per cent of deaths from poisoning in children one to five years of age. In this age group the incidence of poisoning from drugs is, however, far greater than that from household agents. Mellins and co-workers[1] reported the incidence of drug poisoning alone from the Chicago Poison Control Center as 50 per cent. Recent figures from the National Clearing House, as reported by Cann and associates,[2] showed that 50 per cent of the 4,000 cases reported from 29 poison control centers were due to the ingestion of drugs. Figures from the New York Poison Control Center are even higher—an amazing 70 per cent.[3]

In 1956 over 3.5 billion dollars was spent for drugs in the United States, so there is little wonder that poisoning is so frequent in infants and children who learn by exploration, questioning, sampling, and trial and error. They are particularly susceptible to the accidental ingestion of brightly colored, attractively shaped and packaged, sugar-coated drugs of all kinds. This being the case, it should be apparent to everyone that all available safety measures and precautions should be utilized. It is imperative that physicians give more than lip service to this problem and that they stop suggesting that education is the only means of prevention. Precautionary labeling and safety closures are good measures, among others, in the prevention of these tragic accidents.

After trying out more than 14 different types of safety caps over a period of three years, two were finally selected for comparison with the conventional screw cap in 1,600 representative homes with children under five years of age. The objective of this survey was to determine which of the three closures would be most effective in reducing the chances of small children gaining access to aspirin in the containers kept in the home. At the same time, it also was necessary for these safety caps to be designed and constructed so that mothers could remove and replace them with a reasonable amount of ease and convenience.



Safety closure of choice: (A) wording on top, "Keep bottle out of children's reach," for adult caution; (B) glass tapers allow easy cap replacement; (C) grip of cap under glass for tight seal, reseal; (D) wide-design special glass bead to reduce biting or pulling off by children; (E) bead opening, in front and back, for adult "thumb-off" removal.

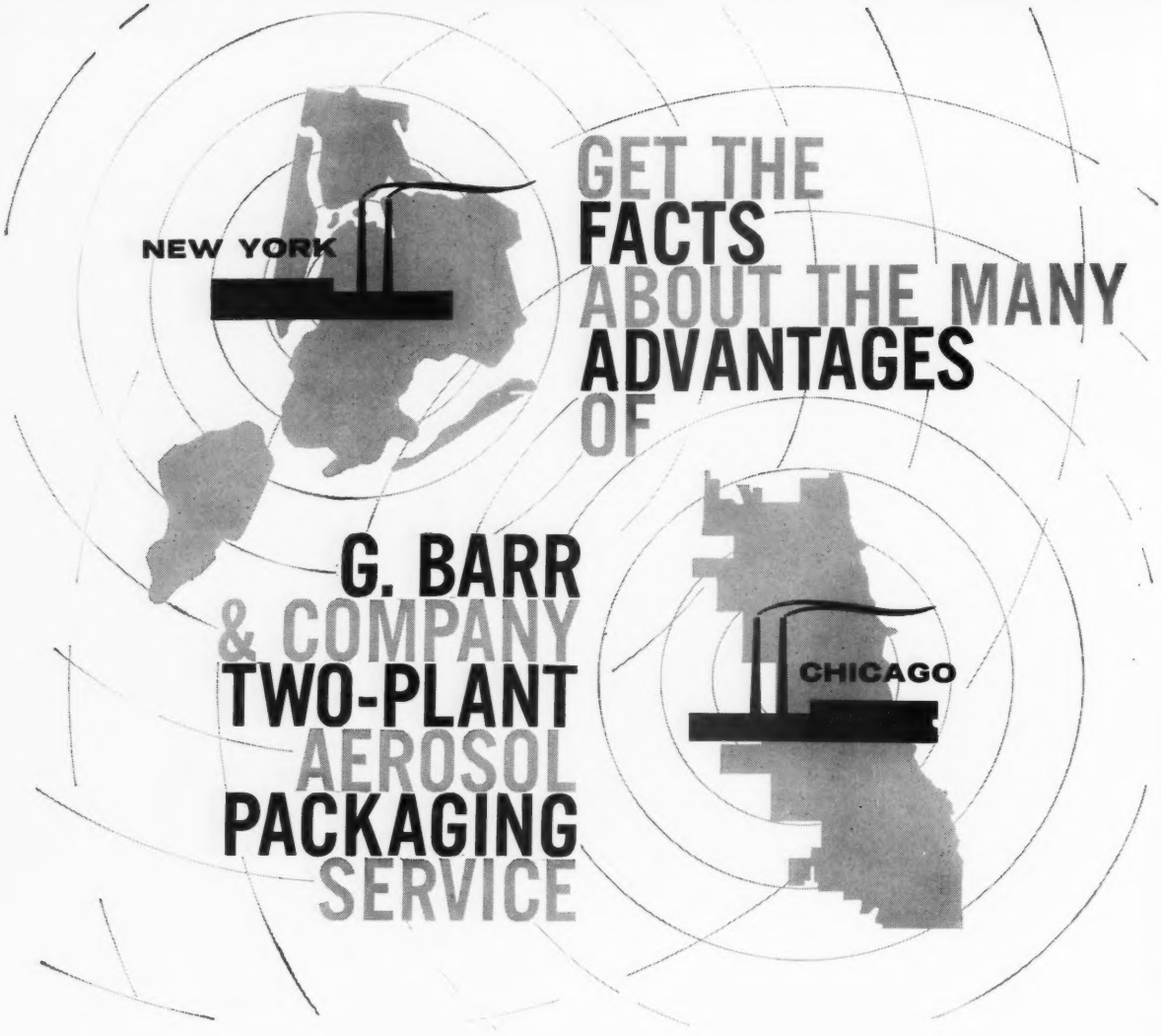
Results of Survey

The following information was obtained at the completion of the survey: The A and B closures were equally difficult to remove by over 93 per cent of the children in the survey, as compared to 66 per cent in removing the screw cap. Only 33.8 per cent of the children had difficulty in replacing the B closure, as compared to 56.8 per cent for the A type and 38.9 per cent for the screw cap. These figures imply that older inquisitive children, in replacing the B cap easily, can conceivably prevent younger infants in the family from gaining access to the contents of the respective bottle.

In the survey of mothers, difficulty in removing the closure was affirmed by over 67 per cent for the A type, 16 per cent for the B type, and 49 per cent

(*Continued on page 257*)

*This study was supported by a grant from Plough, Inc., Memphis, Tenn., and is reprinted from *The Journal of the American Medical Association*, Vol. 169, No. 11.



GET THE FACTS ABOUT THE MANY ADVANTAGES OF G. BARR & COMPANY TWO-PLANT AEROSOL PACKAGING SERVICE

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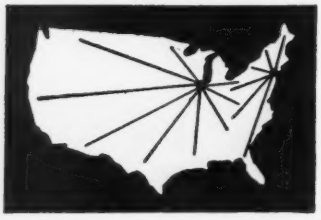
Among these advantages are the potential savings in both shipping and production costs. You also enjoy the benefits of our unsurpassed laboratory facilities, of our two-plant buying power, our time-tested quality controls and the important know-how gained over the years in the production of hundreds of millions of aerosol packages.

There are many other important pluses which *only* G. Barr & Company can offer. We would like to tell you about them, at your convenience and without obligation. Just contact our nearest office for facts.



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G. BARR & COMPANY
PRIVATE LABEL AEROSOLS

Packaging and Selling

Probably more time, more heavy thinking and more money has been invested in finding a way to increase the sale of fragrance products than has taken place in any other part of this industry. In fact, the manufacturers of perfume and fragrance products are the only ones in the entire cosmetic industry to make a cooperative effort to increase the sale of their products.

The Frangrance Foundation was established eight to ten years ago, and has since then had a rather ragged and not too satisfactory a history in its efforts to find a formula that could be used throughout the industry to persuade more women to use fragrance products.

The most recent experiment of the Foundation, the employment of a large public relations company, has, to say the least, been less than successful.

Whether this means that a successful industry-wide effort in promotion for so intangible a product as perfume cannot be formulated, or whether the Foundation will totter along on a reduced effort in the hope that they may come up with a successful formula remains to be seen.

The sales of fragrance products at the manufacturer's level, according to the best informed guess-estimates, now runs at about $80 million annually. This sale covers a wide range of fragrance products and includes not only the imported French perfumes but the domestic perfumes as well as colognes, which are now a part of nearly every cosmetic company and a substantial part of some of the treatment houses.

Although no accurate figures are available, it is undoubtedly true that at least 90 per cent of the fragrance business in this country is in cologne, with a limited amount in toilet water. The American market, as compared to the European market for instance, has been specifically and truly called a cologne market rather than a perfume market.

Again, taking the most informed guess-estimates, not over 25 million American women are using fragrance in any form, that is, perfume, cologne, or toilet water. This does not include, of course, the many millions of other women who are employing fragrance to some minor degree when they apply it through toilet creams, powders, soaps, and similar products.

It is probably true that the fragrance industry, as separated from the cosmetic industry, cannot appraise its market as greater than 25 million women. This has often been compared with the lipstick market—between 55 and 60 million women use a lipstick with some degree of frequency.

It can probably also be said with assurance that there is less frequency of use of a fragrance by a large part of these 25 million women than there is use of a lipstick by its entire market of 60 million women.

In other words, the lipstick market has two and one-half times more consumer customers than the fragrance market has, and undoubtedly a still greater frequency in repeated usage.

There are not many guesses as to the number of women using perfume. Probably it does not exceed or even reach five million women and among these five million, undoubtedly 70 per cent receive the perfume as a gift. Also, undoubtedly, their use of perfume has the least frequency of use of any product in the industry.

If it were possible to examine the books of some of the leading perfume companies and analyze how many customers are required to make this successful business click, the answer would startle many in the industry. For instance, let us take prefume A, one of the fine classical, long-established perfumes with great prestige, which is for sale in any of the fine stores of America. If we take the number of unit packages of this perfume sold as one test, and divide the average price at retail into the average gross sales for that perfume, we will come up with a figure that surely must be accurate within a range of 5 per cent, showing that not more than 250,000 women out of a total of over 60 million women using cosmetics are required to make this famous prosperous business. This is a pretty small percentage of the total market for a very successful business.

Now, supposing that the manufacturer wishes to expand his business during the coming year by a heavy margin of 10 per cent. This means that he will have to woo and win the colossal number of 25,000 women out of the total prospective field of either 25 million fragrance users or 60 million cosmetic users.

It would be very interesting to discover just why it is so difficult for any one perfume company to add such a trivial number of customers as 25,000 women, or even 50,000, during a year of accelerated advertising and promotion. Each perfume company has at its disposal a variety of ways to increase selling.

For instance, in advertising, consider Lanvin, with its aggressive television program and an obviously expanding business. Based on the experience of this one company we could say that increased advertising may perhaps be the answer. But then, a great many people say that that was Arpege—see what a terrific flop increased advertising has been for another company that certainly tried the mystic cycle of moving up to color pages in *Life*, with unhappy

NOW! AEROSOLS SPRAY PAIN AWAY

Pharmaceutical aerosols may see next big market break-through!

Right now, pharmaceuticals are the fastest growing of all aerosol product groups. Pressure-packed drugs showed a sales increase of 50% in 1958 over 1957—compared to a 20% increase for all aerosols. A major market break-through seems imminent—for products such as spray-on burn remedies which are now being marketed, and for a host of other pharmaceutical products which have yet to be put up in aerosol form.

Right now's the time to plan on capturing *your* share of this market. And while you're considering aerosol packaging for your medicinal product—*or any other product* that can be sprayed, poured, brushed, dusted or daubed—General Chemical can be of real help to you in many different ways.

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We will also be glad to put you in touch with highly capable contract filers, who can put up small runs for you or handle full-scale commercial production. They will work with you from planning and testing through to volume filling. You don't have to invest a cent in equipment or production personnel when you work with these contract fillers!

General Chemical services include:

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Or, we might take the case of Chanel, whose extended advertising has certainly been accompanied by a substantial expanding increase in business. Here again some people will point to the unique and superbly successful packaging creation upon which this advertising has been based.

A study of the entire perfume business would seem to indicate that increased advertising by itself is definitely not the answer. Perfume does not seem to lend itself, over a long run, to unusual advertising pressure, nor does the consumer respond with a demand for perfume as a result of advertising, nor, in fact, have the perfume companies to date been able to discover any way to use consumer advertising except to establish that prestige in the consumer's mind which gives a perfume and its manufacturer a slight advantage at the point of sale.

The perfume industry has apparently made its greatest progress in packaging and in the ingenuity of dispensing forms. It might almost be said that the only way in which the perfume industry has shown any creative alertness at all different from the traditional way of doing business has been in its packaging. Almost every year the expanding consumer response has been based on consumer acceptance of intriguing packaging, rather than on any form of outstanding advertising or sales promotion or, anything else that the perfumer might do.

It is pretty generally accepted by perfume companies that what takes place in the retail store, in the salesgirl's mind, and at the counter before the consumer, is the determining factor in the sale of a perfume and the essential opportunity for increased perfume sales.

As just one example of how this can be done, of how ingenuity, energy, imagination, and a flair for cooperation at the point of sale, we recently heard a story about a new salesman in the perfume industry.

This man was employed around the first of the year to cover a limited territory in the east. The territory was neither an urban nor a rural market, but primarily a market of small cities. The salesman came from another trade and was thrown into his territory after only two weeks at the company office. After a few months in the territory the company was astounded to notice a sharply increasing ratio of sales in this normally routine territory. As sales began to increase the sales manager decided that something unusual was happening and that he should get down to this territory and take a look.

The sales manager's visit revealed in a startling way the opportunities that can be opened up by creative salesmanship. He found that this salesman had taken the pains to learn something about the perfume business. He had done a lot of reading and he had come up with a great deal of interesting information about the history of perfume, the romance of the materials that go into perfume, the way perfume should be applied and used by women, and was telling it all in a story capsule form that was extremely interesting to a listener.

Upon entering a town, he first visited the beauty editors of the newspapers. This man always seemed to have something new, intriguing and interesting that usually got at least a few lines of publicity for his product in the newspapers. His next step was to go to the local television or radio station and volunteer to make a brief appearance if there was a time spot to be filled, and, because he was an interesting person and the station was small, he was usually welcomed with open arms. With this background of local publicity, his next step was to visit the store people, usually with some interesting ideas and always with a request to talk to the salesgirls in the store.

In other words, he was carrying out a well-executed sales campaign planned for each store and each locality. It evoked publicity, stimulated interest in his product, and gave the store a good logical reason for favorable activity with this product.

It is often said that America lags far behind European countries in the use of fragrance. And yet, America in wealth and in the social enjoyment of this wealth is far in advance of all of these countries just as America is far in advance of Europeans in its percentage of women who use cosmetics, particularly lipstick.

The curious thing about fragrance seems to be that everybody loves it but far too few use it.

McCall's Magazine has just completed its second Drug Store Seminar and has issued a very interesting booklet containing the discussions.

The panel in this Seminar was made up of six chain store executives. Here is what they had to say on some problems that are certainly timely.

How much self-service should there be in chain drugstores? This question brought out a definite difference in opinion. One panelist stated that his chain was "total self-service" and that all stocks are openly displayed. A second said that the stores of his chain, large though they were, had remained semi-self-service, only to discover that it was unsatisfactory, so they had moved back to an operation featuring a service department (for cosmetics) within a semi-self-service operation.

In general, the panelists agreed that while self-service "works fine" in toilet goods, it is more complicated for cosmetics and "treatment" items. Customers frequently need information and counsel, and for that reason most chains have cosmeticians on the staff whose role is to talk with and advise the customer.

Because there is an increasing tendency to self-service or self-selection in drugstores, and because the supermarket method of shopping, is finding its place in the drugstores, most panelists agreed that the package should be designed for a "hard sell" and

for impulse buying.

Today, packages are esthetic and attractive, but there should be closer identification between package and advertising theme. If there were, the package could close the gap between the impact of national advertising and the customers' act of buying. Two other suggestions were made by the panelists: Advertisers can profit by giving their packages more prominent display in their advertising, in this way making the package more familiar for easy identification by the customer on store shelves or gondolas. Advertisers can also benefit by providing some device so that packages can be priced without detracting from their appearance. This applies particularly to such items as perfume and face powder.

The panelists agreed that deals are important in stimulating impulse purchasing of toiletries. Such offers, particularly when supported by a pre-priced display, often have the effect of "forcing" an additional display of the merchandise.

The panelists also agreed that display material which arrives packed in the same cartons or cases with the merchandise has a much better chance of being used than displays shipped separately, since they frequently get lost in the shuffle.

A major problem with the chains, according to several of the panelists, is that in a great many instances case markings do not identify the contents, with the result that when a shipment from a manufacturer is received by a chain at its warehouse, every carton must be opened before the contents are known. The magnitude of this problem and the mess and confusion it creates can be judged from the fact that shipments from a single manufacturer will run from 300 to 800 cases or cartons and that the number of separate items involved can be as many as a dozen or more. The panelists recommend that cartons should identify contents fully, so that orders from individual stores can be filled by the chain's warehouse more efficiently, promptly and at less cost.

While the panelists agreed, according to one, "that new items are the life blood of our business," they also thought that manufacturers are new-product-happy. One panelist said, "My complaint today is the fact that particularly in the cosmetic business, the manufacturer is too apt to jump on the bandwagon and try to ride the coattails of some other manufacturer who has brought out something that has been particularly successful." Another aspect of this was brought out by one panelist: "Too many manufacturers try to bring out variations of a popular product. Hair sprays are perfect examples, where you have 16 variations."

The panelists were not able to estimate how many new products gain acceptance and achieve success, although the question was asked. They did agree that unless a product proves itself within 30 to 45 days, its chances for success are slim.

The panel agreed that chains look favorably upon contact between manufacturers' representatives and store personnel for the purpose of passing on sales information.

In the June issue, this department discussed the growing interest in private label goods in the retail trade. We quoted Henry Abt, president of the Brand Name Foundation as follows: "Few private labels, charged with the costs of research, warehousing or market devlopment could sell at their present price tickets. In a word, for the most part they ride the coat tails, travel the well-blazed path of makers' brands."

In answer to this, we have just had a letter from Lessing Kole of the Kolmar Laboratories, from which we quote: "Kolmar has tried to lead the procession on basic and applied research. As a matter of fact, Kolmar with no less than five applied research staffs in different areas of the United States and the world and one basic Research Center in Wiesbaden, Germany, has an advantage over one large centralized Research Center. I am sure it is obvious that one Research Center under a director is inclined to follow a certain path or pattern. Applied research groups in this and foreign countries, and with full autonomy, are bound to have broader and let's say more unique results."

We have heard a lot about low pressure selling, but this strikes us as slow pressure selling.

A Jacksonville drugstore has been running local ads advising against the use of tranquilizing drugs. At the same time, it continues to stock and display them, as a service to customers.

Plastic foam is being used by Sara Cooley, Los Angeles cosmetic manufacturers and distributors. The polystyrene used is a lightweight, tough, smooth-skinned plastic molded from thousands of tiny featherlight beads blown into a mold to form a tray to hold cleansing cream, texture cream and avocado night oil.

Something new in the way of a trend may be developing as the result of so many national magazines splitting into local runs.

This is a new development, particularly in the magazine field, where a number of big national magazines now offer advertisers the opportunity to buy not only the entire national circulation but, if they desire, just one section of it. This may be a broad sectional split, such as the Pacific Coast or the middle west. Some magazines, however, are even making available to an advertiser the run for a single state.

Advertisers have available to them the local coverage of the powerful newspaper field, spot radio and television and now, what can be called spot national magazine coverage.

The new trend arising from these opportunities

may come either from a new activity in local private brand advertising or a new activity in concentrated local brands.

Local brands have always held an important position in nearly every territory. The surprising prevalence and position of these brands have been shown in the newspaper consumer panels conducted by leading metropolitan dailies.

In the past, however, these local brands have been identified in the public mind as local enterprises which lack the glamour and the reputation of the big national brands.

Now, for the first time, it is possible for a local brand to become a major advertiser in what the public considers a national magazine.

This national prestige, an intangible and imponderable thing, and yet, considered a very potent force, may now be lost largely as the exclusive monopoly of the national manufacturer. It will be highly interesting to see how this works out.

Even the junior salesman knows that, if he can get an eye-level display position in a retail store, he is on his way to increased sales in that particular store.

Every once in a while, specific figures based on objective tests show precisely what eye-level means.

Just recently, in a supermarket chain, ten stores were remodeled to improve the health and beauty aid departments. In these new departments the health and beauty items were lifted from bottom shelf position to a fixture which rose 39 inches from the floor. Under the health and beauty items were placed such grocery products as soaps, bleaches, coffee, and other traffic pullers. Ten of the chain's stores were used as control units to compare with the ten test stores.

The new eye-level fixtures occupied 195 lineal feet of area, as compared with the previous display of 181 lineal feet. The new fixtures carried 535 items, as compared with 528 on old fixtures. During the test period, stores using eye-level fixtures had a 29 per cent increase in health and beauty aid sales.

Not factual, but as a matter of experience, here is a quote from an advertising agency which has grown up handling supermarket advertising and now handles the advertising account of 17 supermarket chains, most of them competitors: "In baked goods, for example, we know that you can outsell a competitor, two to one, by having your brand displayed at eye-level on the first shelf position reached by a woman in that particular department."

Supermarkets, which have been having a field day picking up the most profitable brand of packaged items in non-foods, may be in for a period of much stiffer competition from other retailers in their own bread and butter.

Department stores are increasingly adding specialty food departments, and now we read that one of the nation's largest variety chains has a delicatessen department in 75 of its stores, having added 54 of these during 1958. The variety stores are also expanding in such things as cookies, nuts and other packaged specialty foods.

During this last year the Toilet Goods Association sponsored a research project to be conducted by the marketing research students of the New York University Graduate School of Business Administration. The papers of the several students who produced the prize-winning essays have just been published by the Toilet Goods Association.

This was a study of drugstore shopping habits primarily concerned with an analysis of the unplanned purchase of toiletries. Here is a brief resume:

The customers who made unplanned purchases more frequently named product display as their reason for the purchase. Although very often more than one factor entered into the decision, the product display comprized 50.6 per cent of the reasons given.

Sales clerk suggestions ranked second, with 11.1 per cent of all reasons for the unplanned purchase.

Pricing came third with 10.1 per cent and posters fourth, with 6.1 per cent; packaging last, with only 1.3 per cent.

The students' reaction to this surprisingly small influence of posters and packages is that the consumer may not be aware of their impact on the decision to buy, and that this factor may be involved in various ways in the effective product display.

Variety stores are substantially increasing their advertising and some of the bigger chains will be aggressive newspaper competitiors with other retailers. In addition to that, leading variety chains apparently are participating heavily in the big cooperative advertising feed basket that manufacturers hold out for retailers.

A panel of variety store experts recently decided that supplier-dealer cooperation, proper timing, and communication are the keys to successful promotion within the variety store.

Of course, these are keys to successful promotion in any retail store, but the experience of manufacturers handing out cooperative advertising is very often that they supply the timing, the communication and the cooperation, but discover very little of the same ingredients available in stores.

A survey by Curtis Publishing Co. shows that 21.8 per cent of all vacations are taken in the fall; 10.4 per cent in the winter; 17.3 per cent in the spring. That leaves 50.5 per cent of vacations to be taken in the traditional June-July-August period.

We think there is a decided trend to spread vacations throughout the year. Even this current ratio of only 50 per cent during the summer period should alter a lot of advertising and merchandising practices based on summer vacations only.

PHOTOGRAPHY BY DICK BOYER

BERNARDIN closures keep good company!

Leadership rests not alone on product quality, but in surrounding and protecting that quality with accessories (like closures, for example) of precisely similar standards. Such, we like to feel is our case with the proud name of Schenley Distillers Incorporated, which produces V.S.R. 3 Feathers. *May our Closure Craftsmen work with you?*

SINCE 1881 · BERNARDIN BOTTLE CAP COMPANY, INC., EVANSVILLE, INDIANA

News in Packaging . . .

Packaging Brochure

A new eight-page brochure describing the economizing advantages of making corrugated packing and shipping containers in a firm's own plant is now available from Colt Packaging Machinery Company, 51 Washington Avenue, Cranston 7, R. I.

The brochure describes the Rite-Size Box Machine, which is designed primarily for the package user who requires varying sizes and quantities of containers to meet daily needs. The machine is said to tailor-make 300 to 500 boxes per hour, as needed, in desired quantities, and a complete dimensional change takes about 1½ minutes. The machine eliminates packing line shutdowns due to carton shortages; frees box inventory capital as well as storage space; and ends box obsolescence as well as the box fillers required for standard size boxes.

Lab Equipment to Rent

Mojonnier Associates, 9151 W. Fullerton, Franklin Park, Ill., has announced a plan to rent to prospective aerosol packagers experimental laboratory equipment for as little as $55 per month. The two units at this rental are simple table-top machines, a valve crimper and a nitrogen gasser. Eight other units are available. Rental fees may at any time be applied to the purchase price.

Youth Market Survey

The 1959 Youth Market Survey for 1959 just published by Scholastic Magazines, reveals that when teenagers make brand choices they often choose more expensive products in spending their annual more than six billion dollars. Covering 5,000 teenagers between 12 and 18 years old, the survey shows that in the area of grooming more than half the girls shop in drug stores. Of those answering specific product questions, 85 per cent have a favorite lipstick brand, 70 per cent, a nail polish brand; 40 per cent use home permanents; and almost half use a fragrance.

The average age at which the boys start shaving is 14. They prefer electric shavers by a small margin, and of those replying to the question, 46 per cent use a specific brand of shaving lotion.

Volume of Folding Boxes Is on the Rise

June shipments of folding boxes topped the dollar volume of a year ago by 6.2 per cent, according to the Folding Paper Box Association of America. June tonnage was 4.6 per cent above that of last year, and for the quarter, 5.8 per cent higher.

The industry volume in June totaled $79,100,000, a new high. Total shipments were 198,000 tons.

Glass Container Manufacturers Institute's ad to appear in *Life*, which will also be available for retailer tie-ins with displays, etc. One of a series, the third will feature fragrances.

Packaging Competition

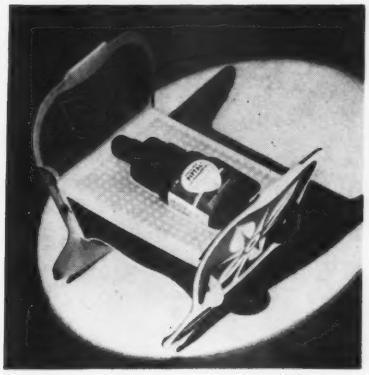
"Cosmetics and toilet goods" is one of ten classifications in the Annual Packaging Awards Competition which will continue through August 31st. *Variety Store Merchandiser*, sponsor, will announce winners in November.

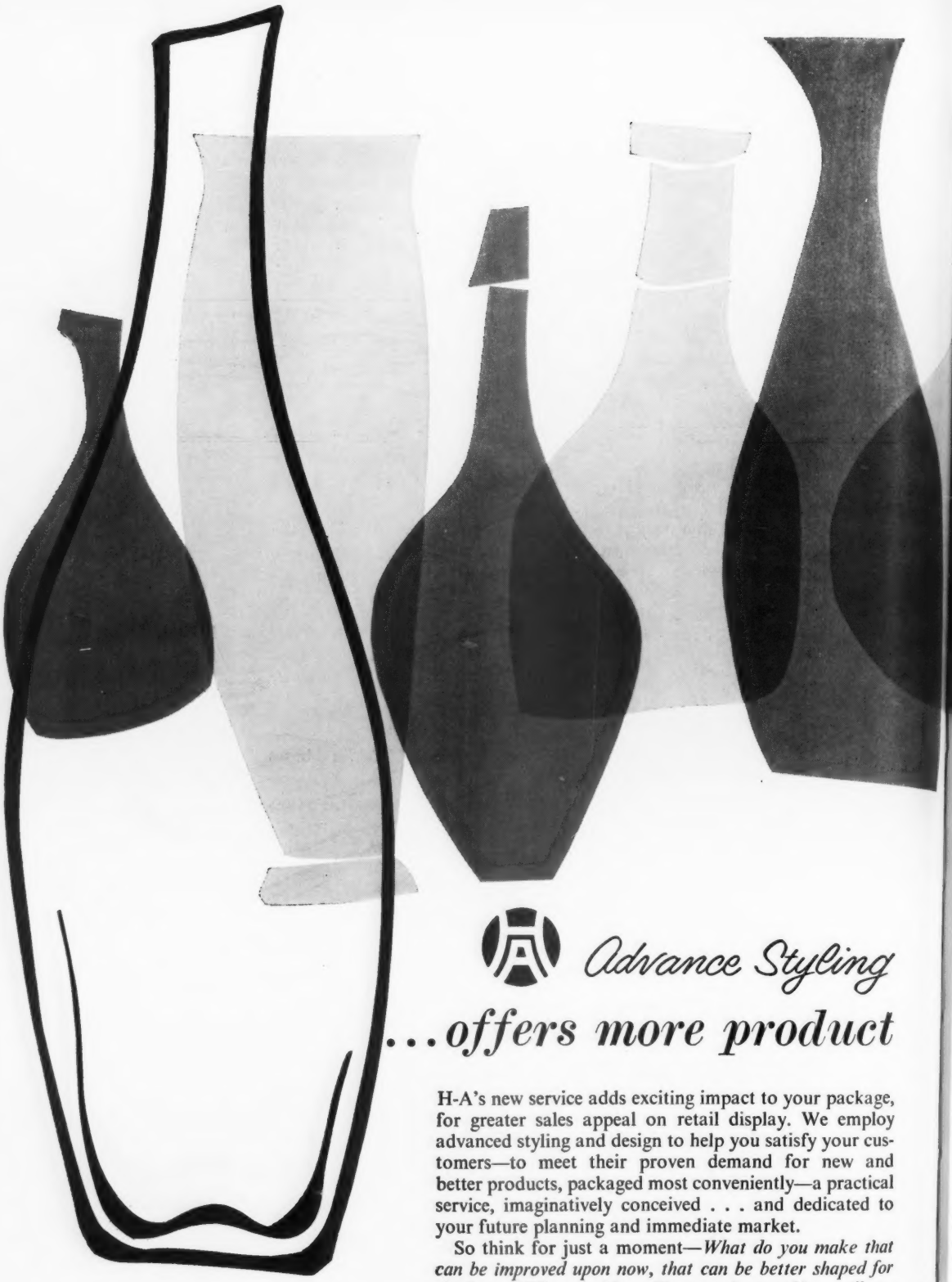
Dermomixin, a bactericide by Pierrel, S.p.A., filled by Solfrene, S.p.A., Italian licensee of Risdon, which also makes polyethylene cap that does not cover actuator and is not removable.

Solu-Plastin improved and repackaged by Schieffelin and Co. The ready-to-use thromboplastin solution is packaged along with equal amount of 0.0125 M. calcium chloride solution, and is dated. Results are quick, precise.

Maybelline Company's new Special Formula Mascara Remover in frosted oblong glass bottle by W. Braun Company, Chicago, with gold lettering by Glasscrafters, Inc., Chicago, and closure by Braun-Hobas Corp., Milwaukee.

Cardboard cradle from single piece, holds Lakeside Laboratories' direct mailing of Pediatric Piptal, designed by Gil Gettleman, made by Forsberg Paper Box Co., and now copied by Scouts, as pattern, to make others.





Advance Styling

...offers more product

H-A's new service adds exciting impact to your package, for greater sales appeal on retail display. We employ advanced styling and design to help you satisfy your customers—to meet their proven demand for new and better products, packaged most conveniently—a practical service, imaginatively conceived . . . and dedicated to your future planning and immediate market.

So think for just a moment—*What do you make that can be improved upon now, that can be better shaped for the future! What would you like to make—and how will you sell it, without advanced styling and design!*

Write Wheeling, or ask your H-A representative how this practical, new service can be put to work for your products today!

and Design Center

excitement with an exciting, new service

HAZEL-ATLAS GLASS

division of

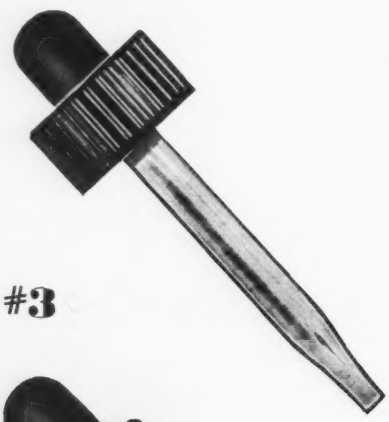
CONTINENTAL CAN COMPANY

Wheeling, West Virginia

A BETTER DROPPING PART MAKES A BETTER PRODUCT

#1

#2



#3

#4

To Be SURE Your Liquid Preparation Can Be Properly Dispensed

SPECIFY

New Perfection DROPPING PARTS

Many a fine product has been rejected by the public simply because some seemingly small detail was below standard. The dropping part can be such a detail—an apparently simple device, yet vital to the user's satisfaction.

Since 1931, when Pennsylvania Glass originated the screw-cap dropping part, we have specialized in this important dispensing unit. This advantage in experience and specialization has made NEW PERFECTION Dropping Parts everything their name implies. Longer experience and undivided attention to one product have resulted in superior quality and reliable performance. To be sure of the best — specify NEW PERFECTION Dropping Parts.

We can supply various colors of bulbs in natural rubber or in our special oil-resisting Amekine compound, caps of plastic or metal in many sizes and colors, and various types of dropper glasses in any length with calibration in any color or plain. New Perfection dropping parts will fit your own bottles, or can be supplied in combination with our Modernistic bottles in Amber, Blue, Green or Clear glass. Sizes: ⅛, ¼, ½, 1 and 2 oz. (Immediate shipment on all sizes and colors).

We can give prompt service on your special requirements for large or small quantities of droppers made from glass or plastic and in special packaging such as cellophane-wrap. Write for samples and prices.

PENNSYLVANIA GLASS PRODUCTS CO. INC.

"Glass Goods of the Better Kind"

430 N. CRAIG ST. • PITTSBURGH (13), PA., U.S.A.

NEWS and VIEWS

BY TED KLEIN PUBLIC RELATIONS DIRECTOR*

The Physician Speaks

Not long ago, Dr. T. G. Baffes, a Chicago surgeon, spoke at a medical meeting in St. Louis. His talk, "The Physician's Dilemma," is one of the most interesting and best stated analyses of the problem of medical postgraduate education I have read.

Simply stated, the problem, according to Dr. Baffes, is "that of preventing intellectual deterioration after (the physician) graduates from medical school." Dr. Baffes says that unless the physician continuously replenishes his medical knowledge, it is either lost or becomes obsolete. "Sooner or later he will find himself in intellectual bankruptcy—making errors, being 'carried' by his colleagues, using obsolete drugs or procedures, being afraid to make statements at medical meetings, and generally being pretty unhappy and frustrated."

Dr. Baffes suggests that the problem begins when the individual starts his medical training. "Medical school . . . should not be an inquisition but an opportunity to gain knowledge . . . (it should) foster that notion in the mind of the student. . . ."

The Chicago physician believes that the problem of keeping abreast of medical knowledge is up to the individual practitioner. First in line in his scheme for keeping posted, is that the physician read and digest the material in professional journals. Then he must attend medical meetings, listen to lectures, evaluate their content. Postgraduate courses at hospitals and medical schools should be attended.

Dr. Baffes concluded with a quotation from the medieval scholar-physician Maimonides, which ends with the thought:

Today he can discover errors of yesterday,
And tomorrow he may obtain new light on what he thinks
Himself sure of today.

How to Handle Trouble

One of the best emergency public relations plans ever put into effect is the current information program of Barnes-Hind Ophthalmic Products, of Sunnyvale, California. This company was the target of the recent FDA action recalling a lot of wetting agent for contact lenses, because the product contained a bacterium potentially dangerous to eyesight.

Barnes-Hind's president, Harry W. Hind, sent a two-page letter along with a complete six-page release on the history of the company, its accomplishments and long record of high quality in product and service, to all science and medical writers in the country. It was received within a few days after the Federal action. It clearly states the company's position and documents a firm and scientific rebuttal of the Government's charge.

Typical of the Barnes-Hind defense is this: The company sent samples to "scattered laboratories—including the research laboratories of the schools of medicine at the University of California and Stanford University—for microbiologic analysis. *Tests have been uniformly negative.* . . . Exactly one week from the date of recall, we were manufacturing a new sterile Wetting Solution in accordance with the amended specifications of the Federal Food, Drug, and Cosmetic Act."

Here is an excellent example of what public relations can and should do when the chips are down. I applaud Mr. Hind and the PR counselor who planned and executed this statement.

4429 a Year or 15 a Week

Hal O'Neill, direct mail expert, writing in a recent issue of Clark-O'Neill's *Indicia* tells us that "for the second year in a row, direct mail volume has remained stationary." From May 1, 1958, to April 30, 1959, the average GP received 4429 pieces of product advertising. Almost 10 per cent was for non-medical wares. Top users of direct mail selling to the physician were the manufacturers of cardio-vascular drugs, who managed to send 9.1 per cent of the total (or over 400 pieces during the year), with information about their drugs. Second in volume were the tranquilizers, 6.9 per cent. And tied for third, at 6.1 per cent, were antihistamines, dermatologicals, steroids, and hormones. Least promoted are the choleretics and contraceptives with 0.4 per cent of the year's total.

Where Is the Show?

A full day at the AMA Convention in Atlantic City this year gave this reporter a great deal to think about. Most interesting was the fact that once again physicians and their families flocked to the beautiful and impressive "commercial" exhibits and left the "scientific" exhibits almost unattended.

I spent several hours in the basement of Convention Hall talking to various physicians who manned the booths. As far as they were concerned, it was a very discouraging experience—"The last time that I'll work so hard to prepare an exhibit to further the knowledge of my colleagues," was one comment.

I am fully aware of the handicaps facing the physicians who prepare the "scientific" exhibits. They know that their booths will be far less glamorous than those of the pharmaceutical industry, that they won't be able to hand out samples, and that their only compensation will be in talking at length about their findings from laboratory or clinical research.

I am concerned that important information (usually not directly connected with a pharmaceutical product, but often somewhat involved with a drug) is not given a chance to "get communicated." The fault, I think, lies with the physician himself. He obviously is more attracted by the fine booths and elaborate displays of the industry than he is by the didactic attempts of his fellow physicians. This is a fundamental wrong that needs to be corrected. Perhaps the industry should broaden its PR programs by supplying help to "glamorize" some of the technical exhibits at medical meetings. I think there is room for an "Association to Provide Funds to Physicians to Build Better Technical Exhibits." Any contributions?

*Paul Klemtner & Company, Inc.

Patent thoughts and trends

BY THOMAS CIFELLI, JR., PATENT ATTORNEY*

Prolonged Action Tablets

In recent years considerable effort has been put forth in order to provide drugs which give a prolonged and more or less uniform therapeutic action. This is particularly true in the treatment of chronic afflictions such as asthma, hay fever, arthritis, ulcers, hypertension, and similar disturbances. The motivating factors in providing such drugs include convenience to the patient and to those administering the drugs (particularly in home therapy), as well as certain physiological factors. As an example, it is usually considered desirable to maintain an asthmatic under the constant influence of medication while at the same time avoiding either over-dosage, under-dosage, or both.

A conventional method for making long-acting tablets is to coat a core of the active ingredient with a substance which will not be affected by stomach juices, but will be dissolved by intestinal fluids, as, for example, a glyceryl ester of a higher fatty acid. To this coated core there is then applied, by means of pan-coating, another layer of active ingredient. One of the disadvantages of preparing tablets of this kind is that physiological action of the active component is unevenly distributed, giving the patient a strong initial dose, followed by a short period of no drug release. After the protective coat has had time to disintegrate, the active material in the inner core is then quickly released and the patient receives the second dose. In the treatment of chronic diseases, this sudden release of drug after a latent period is a highly undesirable manifestation since it may deprive the patient of therapy at a point when he most requires it. Another disadvantage of this type of tablet is the inacuracy of dosage, since the application of the outer coating is difficult to control causing either initial under-dosage or over-dosage.

An alternative method for making "delayed" or "prolonged" action dosage unit forms is to prepare several different groups of granules of the active ingredient, each granule having a different disintegration time. In addition to the fact that this is an extremely costly method of manufacture, this dosage unit form is undesirable because it is difficult to assure a uniform release of the drug. When the granules are coated there is no control measure for ascertaining uniform coating, making it difficult to predict when each granule will disintegrate.

Two Ciba inventors have come up with a modification for which they have obtained U. S. Patent 2,887,438. Their method involves the preparation of a core having evenly and thoroughly distributed therein an accurate amount of a therapeutic ingredient together with a mixture of substances which are non-absorbable from the gastro-intestinal tract. Around this core there is then compressed a layer of a therapeutically active ingredient in admixture with a sufficient quantity of excipients, binders, and lubricants.

The patent gives data to support the claim of even release in the following language:

"To illustrate the surprisingly uninterrupted and evenly distributed rate of release of the active ingredient after the initial absorption of the outer coat, the following test was conducted in duplicate: Six 100 mg. tripelennamine tablets made in accordance with our process were placed in a U.S.P. disintegration apparatus (United States Pharmacopoeia XV, page 937) at 37° C. using artificial gastric juices for the first two hours and artificial intestinal fluid for the remaining hours. (For formulae of these juices see Clarkson, Tablet Coating, p. 64, Drug and Cosmetic Index, 1951). The bath was changed at hourly intervals, and assayed for tripelennamine content with the following results:

Time	Tripelennamine Released Experiment I	Experiment II
	Percent	Percent
1 hour gastric	48.30	38.90
2 hours gastric	4.25	5.30
1 hour intestinal	8.05	7.00
2 hours intestinal	6.62	8.60
3 hours intestinal	7.07	7.80
4 hours intestinal	5.67	7.50
5 hours intestinal	5.67	6.60
6 hours intestinal	10.40	9.20
7 hours intestinal	4.25	9.10

The theory of the action of the tablets is given by the inventors in the following language:

"It is to be noted that our process for preparing prolonged action tablets employs a novel and unique manner of incorporating a therapeutically active substance intimately and thoroughly with a combination of ingredients which are non-absorbable from gastro-intestinal contents. The compression of an outer coating about the inner core, which also contains a quantity of active ingredient, permits quick absorption and rapid physiological response immediately after ingestion. The core, which remains in the stomach contents and eventually passes into the intestinal tract, is subjected to a slow leaching process which, in addition to the normally incurred movements due to spasms, slowly extracts from the core all of the therapeutic component dispersed therethrough."

Examples showing the application of the patented principle as taken from the patent follow. Example 1 involves the use of the same drug, in both the outer layer and the inner core. Example 5 employs different drugs in these areas.

Example 1

"Core."—670 grams of tripelennamine hydrochloride are added to a melted mass of 655 grams of carnauba wax and 655 grams of stearyl alcohol, and the resulting mixture stirred until solidified. The wax mixture is reduced to granules by passing through a No. 16 mesh screen. The granules are lubricated by the addition of 20 grams of magnesium stearate. The mass is well-mixed and then compressed into tablets using a 10/32" size punch and die.

"Coating."—330 grams of tripelennamine hydrochloride are mixed with 132 grams of Carbowax 6000, 1451 grams of milk sugar, 397 grams of confectioner's sugar and 132 grams of talcum. The powders are

*Richards and Cifelli, Newark 2, New Jersey.

passed through a sieve of suitable mesh size, granulated with a binder containing 40 grams of acacia and 40 grams of tragacanth in a 50 per cent hydroalcoholic solution and the wet mass is passed through a sieve. The granulation is allowed to dry at a temperature of about 40° C. and is then passed again through a sieve. The dry granular coating is compressed evenly around the core using suitable mechanical means and a 13/32" size punch and die.

"The above formulation is based on a quantity of 10,000 tablets. When prepared as directed, each tablet will contain 100 mgs. of tripelennamine hydrochloride, 67 mgs. being in the core and 33 mgs. being in the coating."

Example 5

"*Core.*—100 grams of oxyphenonium bromide are added to a mixture containing 440 grams of carnauba wax and 440 grams of stearyl alcohol, and the resulting mixture stirred until solidified. The wax mixture is reduced to granules by passing through a No. 16 mesh screen. The granules are lubricated by the addition of 20 grams of magnesium stearate. The mass is well-mixed and then compressed into tablets using an 8/32" size punch and die.

"*Coating.*—50 grams of chlorisondamine chloride are mixed with 100 grams of Carbowax 6000, 1300 grams of milk sugar, 300 grams of confectioner's sugar and 100 grams of talcum. The powders are passed through a sieve of suitable mesh size, granulated with a binder containing 40 grams of acacia and 40 grams of tragacanth in hydroalcoholic solution and the wet mass is passed through a sieve. That granulation is allowed to dry at a temperature of about 40° C. and is then passed again through a sieve. The dry granular coating is compressed evenly around the core using suitable mechanical means and a 13/32" size punch and die.

"The above formulation is based on a quantity of 10,000 tablets. When prepared as directed, each tablet will contain 10 mgs. of oxyphenonium bromide in the core and 5 mgs. of methyl phenidylacetate as the hydrochloride in the outer coating."

A Problem for Patent Applicants

It is of course well known that the patent laws require one to make a full disclosure of his invention in order to obtain a valid patent. While one cannot argue with such a requirement in theory, in practice some very difficult situations often develop.

Boiled down, the situations referred to are those which arise when someone takes a product that is purchased on the open market and uses it for a certain novel purpose for which a patent is desired. Take, for example, the situation where a paint manufacturer buys a resin and formulates a novel paint from it. In such cases, in order to meet the strict requirements of the Patent Office, the inventor should give a detailed description of just how the resin was made or a citation to the literature showing such a detailed process.

When one remembers that many of the products on the market are nowhere fully described and that manufacturers are understandably reluctant to disclose the exact composition and method of manufacture, it will be seen that a real dilemma exists.

A recent case decided by the Patent Office Board of Appeals points up the problem.

The invention dealt with a process for soda base sulphite liquor. The essential novelty of the process lay in the use of a cation exchange material of a particular class, namely, a synthetic resin base carboxylic acid exchange material in the hydrogen form.

There is a rule of the patent office requiring that a specific embodiment of the invention be described in the specification. The Patent Examiner took the position that the specified exchange material was not identified properly. The applicants had stated that carboxylic ion exchange materials in hydrogen form could be used and gave, as a specific example, Amberlite IRC-50, available from the Rohm and Haas Company.

The patent applicants conceded that not all ion exchange materials would work. They also referred to patent 2,430,111 as describing the making of Amberlite IRC-50.

The Board of Appeals said that, while it may well be that chemists might select or prepare an exchange material suitable for use in the process in the light of the patent in question, this is not the issue. The Patent Office rule in question (71b) was the issue and this rule requires a complete description of a specific embodiment.

The Board told the applicants that they could make a resin in accordance with the known procedures and use it in a specific example; or they could simply have selected any specific resin from any patent and stated that such resin was used in one of their examples.

The difficulty with carrying out the Board's instructions is that the applicants might not be very good resin chemists and might give information which would not be operable. This is a situation which could result in the patent being invalid.

The Board felt that the designation of a compound solely by its arbitrary trade name is not a proper identification of that compound. This is so because a manufacturer may arbitrarily alter the composition and thus leave the public or anyone who later practiced the invention without sufficient information to carry it out.

The situation, while difficult, is not "all black." The Board referred to two situations which might be considered as exceptions to the rule. One is where alkyl aryl sulfonate surface active agents were referred to under a certain trademark "Oronite." This was permitted because the agents remained inert.

The other exception involved the identification of a quaternary ammonium salt as "a mixed higher alkyl benzyl dimethyl chloride (in which the alkyl groups contain 8 to 18 and mainly 12 to 14 carbon atoms)." In the latter case, the Board ruled that anyone skilled in the art would readily recognize the designation of alkyl radicals as being derived from coconut oil or palm kernel oil.

In spite of these recognized exceptions, and perhaps others, the fact remains that patent applicants would be well advised to try to identify in a specific manner all of the materials mentioned in the detailed examples, so as to avoid a ruling of non-compliance with the Patent Office rule governing specific teachings.

(*Continued on page 266*)

408...

a STOCK DESIGN that has a CUSTOM-STYLE LOOK

This attractive bottle gives your product an unmistakable touch of elegance. For regular lines or special promotions it's a proved performer . . . one that deserves your special attention. Available in a range of 7 sizes, from 2 drams to 8 ounces. Supplied either plain or with fired-on ceramic labels.

CARR-LOWREY GLASS CO.

Designers and manufacturers of fine glass containers

Factory and Main Office: BALTIMORE 3, MD. • New York Office: 415 MADISON AVE. • Chicago Office: 1572 MERCHANDISE MART

Aerosol packaging captured 67% of the $47,000,000 room-deodorant market

If your product can be brushed, poured, sprayed or squeezed, this profitable new packaging idea can generate sales for you, too!

A runaway in room-deodorant sales started in 1953 after the aerosol-packaged product was introduced. By 1957 total sales were up to $47,000,000, and the aerosol form accounted for $31,500,000 of this.

The reasons for this success are simple. Aerosols deliver the product in a completely new form that's easier, more effective and often more economical to use. If your product can be brushed, poured, sprayed or squeezed, you stand a good chance to add new sales appeal—create vast new markets—if you package it in an aerosol.

It is not necessary to set up your own packaging line to enter this field. A custom filler near you has the knowledge and equipment to help in every area, from planning through production.

If you don't know the name of a custom filler, write Du Pont. We'll send you a list and include survey data on your market for aerosol products, plus information about Freon* propellents for aerosols. "Freon" is preferred by custom fillers and is used in more of today's aerosols than any other propellent. Write E. I. du Pont de Nemours & Co. (Inc.), "Freon" Products Division 348, Wilmington 98, Delaware.

Best-selling aerosols are powered with

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PROPELLENTS

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101 West 31st St., New York 1, N. Y.

presenting Richford's new

Ambassador

now available with the beautiful Futura Cap in brilliant Goldcote or other finishes

Sizes available: 1½ dram, 2 dram, 1/2 oz., 1 oz., 2 oz., 4 oz.

The Ambassador will be available soon with the beautiful new Ambassador Cap shown here.

Observe the beautifully designed silhouettes of the new Ambassador perfume bottles and the perfect blending of the caps. You can understand our enthusiasm when you consider that each beautifully designed Ambassador is fitted with the fabulous SPILL-PROOF feature. Also available in standard open neck finishes.

WRITE FOR CATALOG OF OTHER RICHFORD PRODUCTS

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DOW | DOW CHEMICALS . . . *Vive la difference!*

In the fascinating "numbers" game of modern chemistry, molecules and molecular weights can be shuffled around like cards into almost endless combinations . . . *winning* ones for the company that capitalizes on these possibilities for product improvement. When today's successful manufacturer determines what the public wants (and where competition fails to provide it) he can call on the chemist to deal his products a significant, sales-making difference. The chemicals reported on here, some new, some old, have helped many manufacturers of cosmetics and pharmaceuticals to win when the competitive chips were down.

You may wish to check certain items in this advertisement and forward to those concerned in your company.

Route to:

_____

_____

_____

_____

GLAMOUR LOTIONS GET LIFT FROM POLYETHYLENE GLYCOLS

When it comes to polyglycols for cosmetics and pharmaceuticals, you pick your weight and take your choice. Dow's family of 12 polyethylene glycols (broadest line commercially available) offers different molecular weights with different properties. The polyethylene glycols with average molecular weights from 200 to 400 and E-600 are all viscous, clear, colorless, somewhat hygroscopic liquids with low vapor pressure. E-500 M and molecular weights of 1,000 or more are wax-like or hard solids. By adjusting the proportions of liquids and solids in a mixture, it is possible to prepare a wide range of useful liquids, pastes, and solids of varying viscosities and melting points.

If more beauty queens seem to be taking more prizes these days, it may be because aids to feminine charm are more potent than ever. The relatively new chemical family of the polyglycols is finding increasing usefulness in the cosmetics field as bases or carriers to increase the effectiveness, safety, and ease of application of many toiletries.

Face value high. In formulas for face cream, protective creams, astringent creams, hair conditioner creams, they act as very effective solubilizing agents and impart good water solubility. For make-up and face powders, the higher molecular weight "PG's" serve as the tie that binds. They help pancake make-up stay in place, once it's applied. They serve as antidusting agents for powders and synthetic detergents.

For more-than-skin-deep effectiveness, the polyethylene glycols offer water-solubility, blandness, wide compatibility, and low toxicity . . . essential to many creams and lotions. Water-solubility permits them to be removed easily from the skin or clothing that may come into contact with such a base. They yield end products with superior softening, conditioning and skin smoothing properties, free from unpleasant tacky feeling. This allows them to be used as a substitute for sorbitol, glycerine, and lanolin, with important savings in cost.

Twelve different polyethylene glycols ranging from liquid to solid offer unique opportunities for product improvement.

In pharmaceuticals, too, the polyethylene glycols are extremely useful bases and carriers for water washable, nonstaining salves and ointments. High compatibility makes them excellent solvents for many common medicaments and assures good contact of the therapeutic agent with the area to be treated or protected. When in contact with the skin, the polyethylene glycol allows for the swift release of the medicament. Some of these agents are sulfur, phenol, ammoniated mercury, mercuric oxide, quaternary ammonium compounds, boric acid, resorcinol, salicylic acid, coal tars, gentian violet, calamine, propionates, undecylenates, sulfa drugs, antibiotics, hormones, cortisone.

The polyethylene glycols are of a relatively low order of toxicity. Re-

peated patch tests on people have shown the "PG's" of no significance in causing skin irritation or sensitization. And, of course, polyethylene glycols E-400 and E-4000 as well as polyethylene glycol ointment are listed in the U.S. Pharmacopoeia XV. Polyethylene glycol 300 appears in the National Formulary X.

What's next? Although a relatively new series of products to the pharmaceutical chemist, polyglycols have already yielded a rich harvest of helpful applications. One such promising field: the use of high molecular weight polyethylene glycols in tablet coating and as a binder in tablet compression.

DOWANOL DPM:

helps "togetherness" pay off for lotions

Cloudy sales days inevitably come to cosmetic and drug products that suffer "ingredient breakdown". Given a choice, customers will buy the product that looks clear and clean as opposed to the ones that look cloudy. And who can blame them?

Dowanol® DPM (dipropylene glycol methyl ether) is actually a supersolvent that performs wonders when it comes to keeping ingredients coupled. Even under the low temperatures frequently encountered in shipping, Dowanol remains the perfect "mixer", so that products arrive at the retailers looking just as clear and bright as the day they left the plant.

Moreover, Dowanol DPM is safe for applications involving skin contact. It caused no irritation or sensitization of the skin when tested undiluted on 250 humans. Its oral, skin absorption, and vapor toxicities are low.

DPM is already serving as perfume fixative, lotion coupling agent, solvent in nail polish lacquers, extraction and crystallization agent in antibiotics. Of course, Dowanol DPM must be evaluated for each application.

DOW CHEMICALS

basic to the drug and cosmetic industry

Aromatics • Emulsifiers • Alkalies
Thickeners • Stabilizers • Glycerine
Solvents • Humectants • Glycol Ethers
Polyols • Preservatives
Ion Exchange Resins
Chelating Agents • Methylcellulose
Amino Acids • Fine Chemicals
Pharmaceutical and Medicinal Intermediates

THE DOW CHEMICAL COMPANY
Midland, Michigan

DOW

ETHANOLAMINES: Crystal-clear outlook for shampoos

Time was when manufacturers of cosmetics, shampoos, lotions and other specialty items found that changing formulas to improve products – and profits—was fine, except for one accompanying problem. Coming up with an emulsifier having exactly the right properties for the new formula was often difficult.

Then came all-purpose ethanolamines and the problem was just a memory. Mixing different ethanolamines with fatty acids produces a wide assortment of emulsifying characteristics. The required viscosity is attained easily and accurately.

Regardless of the method or fatty acid used, or the other variables involved, it's easier to formulate emulsions with ethanolamines.

The trend toward lighter colored shampoos gets an assist from ethanolamines' flexibility. To make these shampoos requires an ethanolamine . . . such as the new, light, clear Dow triethanolamine.

Thanks to their versatility, Dow ethanolamines have been able to make "product" and "profit" hold together for manufacturers with emulsion problems. Dow has more facts awaiting your "on company letterhead" request.

For further information on these products and other Dow chemicals, write THE DOW CHEMICAL COMPANY, Midland, Michigan, Chemicals Sales Department 923AW 8 .

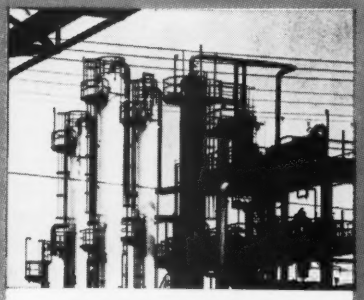
four more PROFITABLE FORMULA BUILDERS . . .

METHOCEL®

Outgumming natural gums . . . these synthetics have wide viscosity range. Invaluable as thickeners, binders, emulsifiers, dispersants.

PROPYLENE GLYCOL USP

All over the U. S. . . . Dow's network of supply points affords fast, dependable delivery of this very economical polyol . . . with unexcelled uniformity!



CHEMICAL INTERMEDIATES

"Building block" chemicals . . . Dow is basic in making these chemicals that form the foundation of so many other fine chemicals.

DOWICIDE®

Prevents product "suicide" . . . used in hand lotions, hair dressings, many cosmetic emulsions to prevent bacterial and mold damage.

Left to right: Richard H. McCarthy, Jr., now director of sales, Bradley-Sun Division, American Can Company; Laverne J. Butcher, who has joined Crown Cork & Seal Company as works manager of Closure Plant No. 10, Baltimore; George Liebel, appointed manager of Felton Chemical Company's Canadian Division; and Walter L. Van Nostrand, who has been appointed to the post of vice-president, production, by the Wallerstein Company.

NEWS...

Appointments and Promotions

Richard H. McCarthy, Jr., has been appointed director of sales for the **Bradley-Sun Division, American Can Company.** Formerly manager of the division's Washington, N. J., plant, he has been with the firm since 1955. In the **Canco** Division, Joseph M. Hall, formerly manager of the Brooklyn plant, has become manager of the coil stock plant in Hammond, Indiana.

Laverne J. Butcher, for many years vice-president of manufacturing for the York Shipley Company, has joined **Crown Cork & Seal Company, Inc.,** as works manager of the company's closure plant No. 10 in Baltimore.

The **Felton Chemical Company** has appointed George Liebel manager of the **Canadian Division.** Mr. Liebel joined Felton's Montreal office in 1944.

Walter L. Van Nostrand, who has been with the **Wallerstein Company, Division of Baxter Laboratories, Inc.,** for 35 years, has been appointed vice-president of production. He served most recently as plant manager at the Staten Island location. H. G. Hinck has become senior vice-president of Wallerstein. He will continue as secretary-treasurer along with the responsibilities of his new position. Dr. Leonard G. Ginger has been named vice-president of research and development for Baxter Laboratories, Inc., where he has worked for ten years, most recently as director of research and development.

C. Frank Morgan has been elected vice-president, and Raymond Strobel appointed sales manager of Albert Verley & Company. Mr. Morgan had been controller and treasurer for Verley for five years, and Mr. R. Strobel has served as secretary, which office he continues to fill.

James K. Ames has become manager of field sales for the **Colton Chemical Company, Division of Air Reduction Company, Inc.** Mr. Ames joined Colton Chemical in 1954 and has served most recently as central district manager.

Mead Johnson & Company has promoted five division sales managers in the **Nutritional and Pharmaceutical Division's** sales department. J. Emmett Terrell is now in charge of the central division; Paul A. Lantrip, the western division; Warren P. Byrom, the Pacific division; Edwin A. Himes, the eastern division; and William C. Mankin, the southern division.

Frederick R. Matthews has been appointed manager of the **Silicone Specialties Division, Dow Corning Corp.,** in addition to his responsibilities as manager of the Greensboro, N. C., plant. Divisional management responsibilities have been transferred from Midland, Mich., to Greensboro, and Louis A. Guglielmo, assistant to the manager of the division, has transferred to Greensboro to continue his responsibilities in product and market development and packaging.

Donald S. Frost has been promoted from vice-president in charge of advertising, **Bristol-Myers Company's Products Division,** to vice-president and member of the general executive staff of the **Bristol-Myers Company.** He will also assume proctorship of **Bristol-Myers Company of Canada, Ltd.** Alfred A. Whittaker succeeds Mr. Frost as vice-president in charge of advertising in the Products Division.

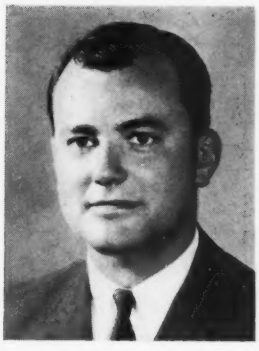
Carrtone Laboratories, Inc., New Orleans, has appointed Wilbur R. Borst technical director. Dr. Borst also heads the firm's control laboratory and new products development program. His previous position was chief research chemist, Plough, Inc., before which he was for nine years with Lederle Laboratories.

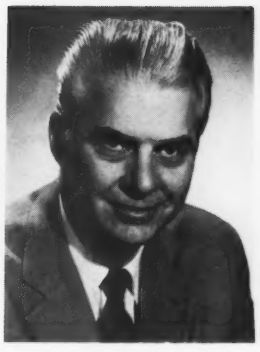
Roy S. Zachary has been appointed marketing director, distributive products department, **Merck & Company, Chemical Division.** With Merck since 1945, Mr. Zachary has served most recently as merchandising manager of that department.

Schering Corporation has appointed Dr. Martin M. Winbury manager of the department of pharmacology. Prior to joining Schering in 1955, he was with G. D. Searle Company. Schering has also appointed Anthony D. Rinaldi government sales manager, and Joseph Kiely assistant government sales manager.

The **Ortho Pharmaceutical Corporation** has appointed Dr. Raymond B. Gochenour director of biochemical manufacturing. Dr. Gochenour has just served for six years as Chief of the Biologics Research Department of the Army Medical Center, Washington, D. C., prior to which he was affiliated with the Pitman-Moore Company as assistant director of biological laboratories.

Frank W. May has become vice-president and general manager of **Ansbacher-Siegle Corporation, Division of Sun Chemical Corporation.**





Left to right: Rose M. Harten, director of public relations for Chanel, Inc.; Walter E. Mullally, a product sales manager for E. R. Squibb & Sons; George D. Selden, who has joined Thatcher Glass Manufacturing Company, Inc., as New York district sales manager for the Plastic Container Division; and Floyd S. Smith, named vice-president in charge of Continental European area (excluding Italy) for Eli Lilly and Company.

Rose M. Harten has joined **Chanel, Inc.,** as director of public relations. Her responsibilities include developing and coordinating consumer, trade and media relations, and product promotion and information. She formerly served Hill & Knowlton, Inc., most recently in charge of public relations for the Fragrance Foundation.

Walter E. Mullally, assistant manager, veterinary department, **E. R. Squibb & Sons, Division of Olin Mathieson Chemical Corp.,** has become a product sales manager. Mr. Mullally has been with Squibb since 1936, with time out for service in the U. S. Army Air Force. James H. Douglas has become assistant manager, branch operations. Most recently serving as coordinator of sales promotion planning, Mr. Douglas has been with Squibb since 1940 except for his service in the U. S. Army. Squibb has appointed Norman A. Sprei director of professional advertising, succeeding Howard W. Baldock, who has been named director of medical relations. Mr. Sprei had been with Lederle Laboratories as a product group advertising manager.

The Thatcher Glass Manufacturing Company, Inc., has appointed George D. Selden New York District sales manager for the Plastic Container Division. Mr. Selden had been with Vick Chemical Company as director of market and product research for the Extruded Plastics Division.

Floyd S. Smith has been named vice-president in charge of the Continental European area (excluding Italy) of **Eli Lilly International Corporation,** and William C. Power, Jr., vice-president in charge of the area including the British Commonwealth, Italy, Africa, and Asia. Both are also now members of the board of directors of Lilly International, as is R. S. MacNeill, vice-president in charge of Latin America. Since 1950, Mr. Smith has been manager of the Zurich area and Mr. Power has served as associate director of the British and Eurasian area since 1947. Changes in **Eli Lilly and Company**'s advertising services division have resulted in the promotion of Charles F. Buck to assistant director of advertising services in charge of copy and design; Louis R. Baumgardt, to manager of the merchandising operational records department; and Edward R. Schern to manager of the merchandising production department. John F. Schaefer has been named manager of the firm's accounting operations department. He succeeds Kent R. Crawford, who has been promoted to assistant director of the accounting interpretations division.

Arthur J. Rigman has been appointed assistant vice-president and manager of sales of the **Atlantic Division, National Can Corporation.** Most recently Mr. Ring has been sales manager of the southeast district of that division. L. D. McEvoy, for 36 years with National Can, has become plant manager of the Baltimore plant. Mr. McEvoy joined Metal Package Corporation, forerunner to National Can, in 1923.

The **S. E. Massengill Company** has appointed William E. O'Connell as New York regional sales manager in charge of sales activities in the northeast, including the Middle Atlantic States and New England. He was formerly with Winthrop Laboratories.

Bauer & Black, Division of The Kendall Company, has established a new consumer products department under the direction of A. J. Hawkes. Mr. Hawkes joined the firm in 1939, serving most recently as merchandise manager of the Curity-Curad line.

Edward F. Hensley has become project manager of major foreign engineering and construction projects for **Dow Chemical International Limited, S.A.** Mr. Hensley, a professional engineer, has been with Dow since 1937, and has recently returned from Japan, where he assisted Asahi-Dow Limited.

Pharma-Craft Company has named two vice-presidents, Leonard V. Colson, vice-president in charge of advertising, and Charles W. Davies, vice-president in charge of sales. Mr. Colson had been vice-president of Warwick & Legler. Mr. Davies was formerly general sales manager with Pharma-Craft.

The **Ames Research Laboratory, Ames Company, Inc.,** has named Dr. Alfred H. Free as director, with responsibility for the basic research and product development programs.

Rowell Laboratories, Inc., has named Thomas E. Dinndorf as director of manufacturing.

Charles H. Shields, Jr., has become supervisor of new product development for the **Heyden Newport Chemical Corporation,** where he has been in market development for newer organic chemicals.

Eastman Chemical Products, Inc., subsidiary of Eastman Kodak Company, has appointed C. R. Lee to the sales office in Skokie, Ill. Mr. Lee has been sales coordinator at the firm's home office.

ALUMINUM HYDROXIDE

DRIED GEL

OR

Wet Gel

you will find the ALUMINUM HYDROXIDE *you need at* J.T.Baker

Whether you use a DRIED GEL or a WET GEL, you will find at J. T. Baker the Aluminum Hydroxide best suited to your pharmaceutical formulation, and your equipment. Baker offers you five forms—3 dried, 2 wet—each of unsurpassed quality, and each possessing specific processing advantages.

DRIED GELS, *ideal for tablets and powders*

1. *Dried Gel, Free-Flowing, Medium Powder*—Meets U.S.P. specifications. Is white, tasteless, non-sticky. Baker's special process assures a completely amorphous Aluminum Hydroxide with high activity and acid-consuming capacity (min. 250 ml. 0.1 *N* HCl per gm.). Provides a bulk density (19-21 lbs./cu. ft. tapped-constant vol.) which is optimum for many formulation needs. Mixes readily, flows freely with minimum dusting.

2. *Dried Gel, Medium Powder*—A physically modified, fine particle size, dried gel with little dusting tendency and having different wetting characteristics for certain granulations. Affords a bulk density of 13-18 lbs./cu. ft. Meets all U.S.P. requirements for activity and chemical purity.

3. *Type AA-D*—Developed to help you formulate a smaller tablet of higher potency. AA-D provides a guaranteed assay range of 54.0-58.0% Al_2O_3, and minimum acid consuming capacity of 280 ml. 0.1 *N* HCl per gm.... in addition to meeting U.S.P. requirements. Density is controlled within the range of 3.8-4.5 ml. per gm. AA-D mixes readily and flows freely with minimum dusting.

CONCENTRATED WET GELS, *ideal for liquid formulations (actual Al_2O_3 content reported on label)*

1. *Type 300* offers excellent stability in 4% formulations corresponding to Aluminum Hydroxide, U.S.P. Gel. It is also useful for antacid liquid formulations that do not contain bulky additives. Type 300 pours easily, undergoes little or no separation on standing either before or after reconstitution. On dilution, provides suspensions of reproducible viscosity.

2. *Type 150*—A thinner wet gel than Type 300. Recommended when a more pourable gel with higher Al_2O_3 content is required, or for formulations containing magnesium trisilicate or other bulky solids.

Other important antacid materials offered by Baker include Magnesium Trisilicate, U.S.P., Magnesium Carbonate, U.S.P., Bismuth Subcarbonate, U.S.P., and Bismuth Subnitrate, N.F.

May we send you Product Data Sheets on J. T. Baker Aluminum Hydroxide dried and wet gels?
Do you have specific questions about their use in your formulation?
May we send you samples for your evaluation? Write—

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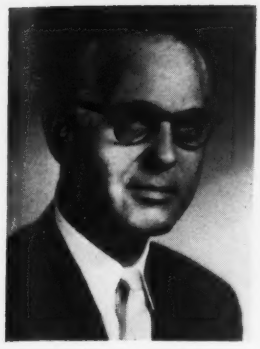
J. T. Baker Chemical Co.
Phillipsburg, New Jersey



Left to right: Lawrence F. Heileman, managing director, Cosmetic and Aerosol Divisions, and Donald S. Tuttle, Jr., now sales manager of the Cosmetic Division as well as of the Aerosol Division, both of the Risdon Manufacturing Company; William R. Tierney, who holds the newly created position of vice-president, sales, Clairol, Inc.; and Robert V. Knapp, sales representative, Fine Chemicals Division, Shulton, Inc.

Lawrence F. Heileman, manager of the Danbury plants for the **Risdon Manufacturing Company,** has been appointed managing director of the **Cosmetic and Aerosol Divisions.** Edward Noyack, factory manager of the Naugatuck plant, is now managing director of the Naugatuck and Waterbury plants. Donald S. Tuttle, Jr., sales manager of the Aerosol Division, has been made sales manager of the Cosmetic Division as well. And Raymond W. Wolff, for 11 years sales and design engineer in several Risdon divisions, has been named product development manager of the Cosmetic and Aerosol Divisions.

Formerly director of marketing, **Clairol, Inc.,** William R. Tierney has been appointed to the newly created position of vice-president in charge of sales for the company.

Robrt V. Knapp, who had been a sales representative with S. B. Penick & Company, has been appointed a sales representative for the **Fine Chemicals Division, Shulton, Inc.,** in New York City, the Bronx, Westchester and New England. Alastair B. W. Anderson, new product development manager, has become a product manager for the firm. Raven Rumell has joined Shulton as a sales supervisor for the consumer products of the Fine Chemicals Division, with headquarters in Los Angeles. Mr. Rumell had been with the Los Angeles Soap Company.

Edgar W. Nelson has been named to the newly created post of general manager of the **Lehn and Fink Division, Lehn and Fink Products Corp.** Mr. Nelson has been senior vice-president of the Market Planning Corp. Dr. Robert F. Prindle, director of research for the firm since 1954, has been named director of the newly established Home Health Information Bureau, sponsored by the Lysol Division, for the purpose of providing the public with information on ways to fight infection and disease in the home.

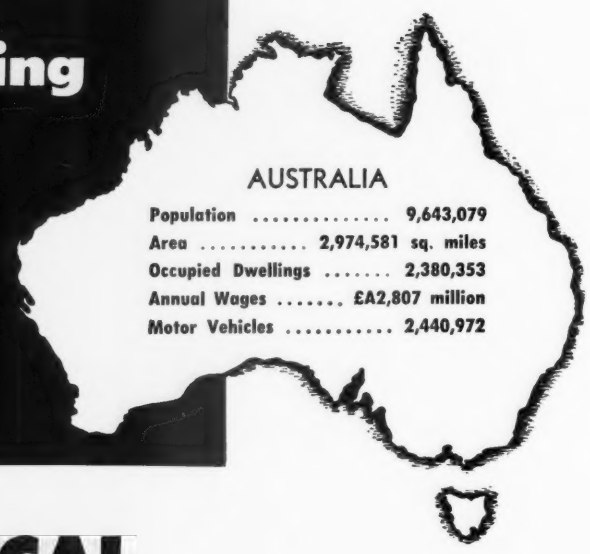
Dr. William J. King has been appointed manager of **Colgate-Palmolive Company's Laboratory for Dental Medicine Research.** Dr. King, previously head of the Toilet Articles Division, oral products research section, succeeds Dr. John W. Hein, who has become dean of the Dental School at Tufts University. Dr. John M. Longfellow has been named head of the oral products section. He is replaced as chief of the skin products section by Dr. Hyman Henkin, of the hair products section. Dr. Richard K. Lehne has become head of the hair products section. Stuart Sherman has resigned as corporate vice-president, marketing, to obtain the rest required by a serious eye illness. He continues a member of the board of directors. John L. Bricker, vice-president of marketing planning, has been named to succeed Mr. Sherman as corporate vice-president of marketing.

The **Western Petrochemical Corp.** has named Professor Herman F. Mark to its board of directors. Professor Mark is Director of the Polymer Research Institute of the Polytechnic Institute of Brooklyn, and currently serves as consultant for firms. He is editor of the *Journal of Polymer Science.*

Bill Rowells has become director of a newly established package design department of **Helen Curtis-Lentheric.** He has been art director for the firm since 1957.

Left to right: Edgar W. Nelson, named to the newly created post of general manager, Lehn and Fink Division, Lehn and Fink Products Corp.; Dr. William J. King, manager of Colgate-Palmolive's Laboratory for Dental Research; Professor Herman F. Mark, named to the board of directors of Western Petrochemical Corp.; and Bill Rowells, director of the new package design department, Helene Curtis-Lentheric.

Manufacturing
Distribution
Marketing
Advertising



THE CHEMICAL HOLDINGS GROUP

Chemical Holdings Pty. Ltd. is the parent company of a group of wholly owned subsidiaries encompassing the manufacture, sales promotion, advertising and distribution of pharmaceutical and allied products. With 30 years' experience in its field, Chemical Holdings offers to overseas principals a service unequalled throughout the Commonwealth. Overseas firms interested in establishing themselves in Australia are invited to consult us. The Company, upon request, will investigate and report on all aspects of the market without obligation. All enquiries addressed to the Managing Director will be treated in the strictest of confidence.

● **KINGSGROVE LABORATORIES PTY. LTD.**

A modern pharmaceutical factory of 40,000 square feet equipped with modern plant and staffed with experienced and technically qualified personnel. Kingsgrove Laboratories provides its clients with a high standard of production carried out under strict analytical control. Manufacturing can be carried out on any scale and an extensive range of packaging finishes is available. Qualified personnel advise on formulations, labelling requirements, packaging, and shipment can be arranged to any part of the world. Production includes the manufacture of such items as tablets (coated or plain), powders, liquids, pastes, creams, ointments, etc. All enquiries will be treated in strict confidence and references supplied upon application.

● **COMMONWEALTH AND DOMINION AGENCIES PTY. LTD.**

The oldest and foremost distributing and sales promotional company in Australia servicing the pharmaceutical and grocery trades in advertised proprietaries. The company maintains a large team of specialty salesmen and depots at all capital cities. In past and recent years the company has successfully launched a large number of products in Australia and has initiated the modernisation of package presentation of many world-famous products to meet changing merchandising conditions. Evidence of the company's ability will be readily confirmed by its principals, the names of whom will be supplied by arrangement.

● **PHARMEDICA PTY. LTD.**

A distributing and sales promotional unit specialising in ethical pharmaceutical products. Directed by technically qualified executives of many years' administrative and practical experience, Pharmedica maintains a medical detailing force and stock depots in all capital cities, and detailmen are closely supervised by personnel with field experience. Promotional campaigns including medical mailings and journal advertising can be formulated to suit principals' budgetary requirements.
With important representations covering the United Kingdom, Switzerland, Germany and the U.S.A., references will readily be supplied on application.

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(6 lines)

Parker B. Smith, formerly general manager of the international department, The Borden Chemical Company, has been appointed director of sales administration, **Century Chemical Corp.**

Harvey Richards has been promoted to production manager and purchasing agent at **West-Ward, Inc.**

Dr. Albert H. Holland, Jr., formerly medical director of the United States Food and Drug Administration, and more recently executive vice-president of the Cortez F. Enloe agency, has joined the **American Home Products Corp.** of New York City.

Brett Rich of the **Purex Corporation, Ltd.,** has become the firm's director of research.

Turner Tube Corporation has elected Ambrose Y. Frantz, plant manager, to the position of vice-president.

William Lyons has become advertising manager of the **U. S. Division, Max Factor & Company.** He succeeds Robert Schafhausen.

George F. Halfacre has been elected vice-president in charge of manufacturing, the **New Jersey Zinc Company,** succeeding Philip M. Ginder, who has retired. Mr. Halfacre has served the company in a variety of capacities since 1918. The firm has made the following appointments in the zinc and pigment consuming fields: Harold R. Frasure, in Cincinnati, covering the Columbus, Dayton and Indianapolis areas as well; Stanley E. Moore, in the Minneapolis-St. Paul area; John B. McCarthy in Los Angeles; and Walter E. Menhinick, transferred from Chicago to St. Louis, also to cover the Kansas City and Louisville areas.

James A. O'Connor, M.D., and Leonard S. Brahen, M.D., Ph.D., have joined the staff of the clinical research department of **Chas. Pfizer & Company.** Dr. O'Connor, in private practice since 1953, was proviously assistant to the medical director of Glaxo Laboratories, Ltd., England. Malcolm K. Nielsen has joined the divisional headquarters staff of **Pfizer's Chemical Sales Division.** He is succeeded by Richard L. Groben as western regional manager. Mr. Grober was with the division's medicinal chemical department. Arthur F. Leydon has joined the medicinal chemical department after serving as manager of the pharmaceutical section of the Pfizer technical service department. Robert A. Moura, M.D., has joined the firm's Biologic Research Center as a research virologist, and Henry Chol Lim has been appointed as a process development engineer, at Groton. Dr. Moura was formerly in public health work in Brazil, and Mr. Lim has been a research assistant for two years at the University of Michigan Research Institute. Dr. Albert Forlano has joined the firm at the Brooklyn research laboratories as a pharmaceutical research chemist. Paul S. Sullivan, organic chemist has joined the Groton plant's organic department.

Edward D. Alper has been named a vice-president of the **Nepera Chemical Company, Inc., subsidiary of Warner-Lambert Pharmaceutical Company.** Since 1957, he has been plant manager of Nepera.

R. H. Steuben has become general manager and treasurer of the Mexican pharmaceutical house, **Madon's Pharmaceutical de Mexico, S.A.** For the past 15 years, Mr. Steuben has directed the international operation of Cutter Laboratories. He assumes his new position on Sept. 1.

Robert Granitz, formerly sales representative for **Charles of the Ritz,** has been appointed vice-president and general manager of that company's subsidiary, the **Alexandra de Markoff Sales Corp.**

Wayne E. Edwards has been appointed director of the expanded Research and Product Development Division, **Allen B. Wrisley Company.** He was director of product development and analytical research for the Purex Corp. laboratories.

Election of Robert R. Musser and Victor C. White as assistant treasurers of the **Rexall Drug and Chemical Company** has been announced. Mr. Musser is budget director of the company and will assume additional duties in banking relations. Mr. White will head the tax department.

Robert H. Woodward has been elected to the board of directors of **The William S. Merrell Company.** He has been assistant to the president and chairman of the new products committee.

Dr. Herndon Jenkins has joined the chemical research staff of **A. H. Robins Company, Inc.**

McKesson & Robins, Inc., has appointed Walter M. Burgess district manager of the northeast chemical district. An assistant district manager for the past five years, he succeeds P. E. Truesdale, who resigned recently.

J. J. Curry, veteran of more than eight years in the sales and service of industrial lift truck equipment, has been named midwest regional sales manager by the **Yale Materials Handling Division, The Yale & Towne Manufacturing Company.**

New Book on Childbearing

Ted Klein, public relations director for Paul Klemtner & Company, Inc., is co-author with Dr. Robert Mitchell of a book, *Nine Months To Go*, to be published by Lippincott this winter or in the spring of 1960. A guide for expectant parents, the book will provide comprehensive medical information and psychological reassurance.

TED KLEIN

Lilly's Dr. Chen Chosen

K. K. Chen, M.D., Ph.D., director of the pharmacological research division of Eli Lilly and Company, has been chosen by the National Academy of Sciences as a delegate to the Second General Assembly of the International Union of Physiological Sciences in Buenos Aires during August. One of five delegates from the U.S.A., Dr. Chen is meeting with the group to discuss policy in promoting the physiological sciences.

While in Buenos Aires, Dr. Chen will read a scientific paper before the International Physiological Congress, which is meeting there at the same time.

Increasingly the product of choice...

SINDAR'S G-11® (HEXACHLOROPHENE U.S.P.)

Here are the facts which have convinced so many leading manufacturers of soaps and cosmetics that G-11 is the most effective germicide and deodorant available.

Deodorant Action: Scientific studies have proved that G-11 remains on the skin even after washing. It therefore provides *continuous* control – between washings – of bacteria that cause perspiration odor.

Proof of Skin Degerming: 40 independent investigators agree that G-11 reduces the bacterial population of the skin by 95% or more. 150 scientific publications attest to its effectiveness. Over 95% of America's hospitals use it for surgical scrub and other purposes.

Consumer Acceptance: More consumers buy G-11 – Hexachlorophene – soaps than any other deodorant bar. Hexachlorophene is known to millions of people.

Soap Compatibility and Stability: G-11 is effective in *all* types – bar, powder, and liquid soaps and detergents. It is also non-corrosive, alkali stable, effective at all pH's.

Non-Irritation of the Skin: Established by its use in billions of cakes of soap and millions of units of cosmetic and pharmaceutical products such as lotions, oils, powders and ointments for babies as well as adults.

Quality: All production meets U.S.P. specifications.

Availability: Immediate shipment of truck or carload quantities from stock. Available around the world.

Technical Service: Sindar discovered hexachlorophene, holds the patents, pioneered its use in antiseptic and deodorant soaps, and is ready to assist you with your technical problems and to supply data on its varied applications.

SINDAR® Corporation
Industrial Aromatics and Chemicals

321 West 44th Street, New York 36, New York

Floyd M. Cornwell, pharmacist and Mayor of Webster, S. D. (right), receives A. H. Robins Bowl of Hygeia award for outstanding professional and community service, from C. E. Morton, Kansas City division manager for Robins.

McClintock Retires

Earl Irvine McClintock, senior vice-president and a director of Sterling Drug, Inc., has retired after 40 years with the company. Mr. McClintock joined Sterling in 1919 as vice-president of its Bayer Company, and was elected to his present post in 1942. Experienced in international trade, he served the Bureau of Corporations, predecessor to the Federal Trade Commission. He assisted in framing the Federal Trade Commission Act.

C. L. Huisking Honored

Charles L. Huisking, chairman of the board of Chas. L. Huisking & Company, Inc., was among those honored at St. John's University's annual commencement. He received the honorary degree of Doctor of Commercial Science.

Mr. Huisking is a director of St. Clare's Hospital in New York City, a director of Warner-Lambert Pharmaceutical Company, and a past chairman of the Drug, Chemical and Allied Trades Section of the New York Board of Trade.

Dr. French Elected

Dr. Chester L. French, head of the quality and related problems group of Mallinckrodt Chemical Works, has been elected chairman of the Labels and Precautionary Information Committee of the Manufacturing Chemists' Association, Inc. He has been a member of the committee since 1955.

The committee consists of 20 members selected from member companies of the Association, to promote uniform and precautionary labeling of industrial materials.

Dr. Mayer Retires

Dr. Rudolph L. Mayer, a significant contributor to such diverse fields as hay fever and leprosy, retired June 30 as director of microbiology at Ciba Pharmaceutical Products, Inc.

Dr. Mayer, 64 years old, joined Ciba in 1943 and established its microbiology department. Before that he was head of a research laboratory in Poland, where he worked on antihistamines. He discovered Pyribenzamine for hay fever, which was marketed in 1946, and is still widely used.

Dr. Mayer will be associated with the Leonard Wood Memorial Foundation in Washington, D.C., after Sept. first.

Felton Director Attends Grasse Conference

Ira B. Kapp, technical director of the Felton Chemical Company, was among the group at the International Congress held in Grasse, France. Accompanied by Leon Gefen of the firm's Versailles branch, Mr. Kapp will review the meeting's major points on his return.

Perfume and essential oil producers attend the Congress on special invitation.

Employee Completes 50 Years with Fritzsche

Frank E. Riley has rounded out 50 years with Fritzsche Brothers, Inc., in the shipping department. He is now the only living member of the 88-year old organization to have served so long.

In recognition of this record, he was presented with a gift of government securities by President John L. Cassullo on behalf of the firm's officers and directors, together with tokens of esteem and friendship by his fellow employees.

H. R. Shepherd Elected Trustee of Pharmacy College

H. R. Shepherd, president of Aerosol Techniques, Inc., has been elected to the board of trustees of the Columbia University College of Pharmacy.

The association of Mr. Shepherd with the College of Pharmacy of the City of New York, a division of Columbia University, began with a grant in 1958 from ATI to help establish a new aerosol research laboratory.

Harold L. Prentzel (second from right), member of the Board of Regents, American College of Hospital Administrators, Montgomery Hospital, Norristown, Pa., receives $5,000 check from Dr. Elmer Funk, Wyeth Labs., to underwrite new handbook on administrative residency.

Wrisley Expands Research Product Development Division

The Allen B. Wrisley Company has expanded its Research and Product Development Division. In addition to research and product development, the newly formed division will supervise quality control, being responsible for inspection of incoming materials, maintaining of quality during manufacturing, and inspection and approval of finished goods. Technical aspects of packaging and packaging materials will also be studied.

Wayne E. Edwards, who is the director of the Division, was formerly director of product development and analytical research for the Purex Corp. laboratories.

Esperis President Visits U.S.A.

Adrian Fayaud, president and managing director, Esperis s.a., makers of products for cosmetic manufacturers in Milan, Italy, was recently in the United States to introduce his company's essential oils and cosmetic chemicals to the trade.

The American Lanolin Corporation, Lawrence, Mass., which has been marketing Esperis Hydrogenated Lanolin for some time, has announced the intention of handling other products as well.

A. de Markoff Moves

Alexandra de Markoff enters a new phase with the appointment of its own sales staff, and removal of its offices to 745 Fifth Ave., N. Y. C. 22, on Sept. 1.

S.C.C. of Great Britain

The Society of Cosmetic Chemists of Great Britain held its annual meeting recently at 55 Park Lane. The following officers were returned: president, R. H. Marriott; vice-president, H. W. Hinnott; hon. secretary, L. S. Smith; hon. treasurer, R. E. Spate. Three new council members were chosen: K. G. Johnson, A. W. Middleton, and L. P. Torry.

The meeting ended with presentation of a silver salver to Mr. Riley who, as honorary secretary from 1954 to 1959 has rendered outstanding service to the Society and Council.

Rudolph H. Blythe (left) of Smith Kline and French Laboratories, Honorary Chairman of the first annual national industrial pharmaceutical research conference, held at Land O' Lakes, Wisconsin, congratulates Jack Cooper, Ciba Pharmaceuticals, Inc., after his selection as 1960 conference chairman. Louis W. Busse (center), Associate Dean of the University of Wisconsin School of Pharmacy is again conference secretary.

Industry Honors Max Factor & Company

More than 500 cosmetics manufacturers and suppliers from all parts of the U. S. and several other countries joined together at a champagne banquet in Beverly Hills, Calif., to pay tribute to Max Factor & Company during the firm's 50th annivesary.

A gold plaque commemorating the event was presented to Davis Factor, chairman of the board, and Max Factor, Jr., president, by Donald A. Breyer, president of the California Cosmetics Association.

Butler Chooses F.M.C.

F.M.C. International has been appointed exclusive export sales agents for Web Splicing and Web Bending enquipment, produced by Butler Automatic Machine, Inc., manufacturers of machinery for the food and packaging industries.

New Private Label Cosmetic Company in Japan

Kolmar Japan, Ltd., in Tokyo, Japan, has been formed as a private label cosmetic manufacturing company with Nickolas Ermakoff as president. Mr. Ermakoff has been in the cosmetic business for 14 years in Japan, and has spent some time in the U. S. working with Kolmar personnel and formulae.

A complete line of cosmetics is to be manufactured as in other Kolmar plants. A new site has been purchased outside of Tokyo, and sales offices will be maintained in Tokyo proper.

Kolmar has also announced agreements entered into with the Tata family in India. Details will be given later.

Dow Opens Office In Johannesburg

Dow Chemical International Limited, S.A., has announced a new sales office in Johannesburg, Union of South Africa. John R. Myers, area supervisor for Europe and Africa has been named sales supervisor of the office, which will serve the entire continent south of the Sahara.

Arthur Colton Expands

Construction has begun on a new plant in Elk Rapids, Mich., to manufacture punches and dies for pharmaceutical and chemical industry tablet presses has been announced by the Arthur Colton Company. The Colton Mancelona plant will be given over to manufacturing filling machines and aerosol filling equipment, when the new plant is complete.

Miss Charlotte Payne celebrated half a century of service to the Sheffield Tube Corporation at a company dinner in her honor. L. Tracy Sheffield, president and treasurer (left), presented Miss Payne with a check for $1000; T. C. Sheffield, vice-president, (not shown), presented her with the firm's 50-year pin, and W. Kyle Sheffield, executive vice-president and secretary, presented her with a Tiffany silver bowl.

Rexall Acquires IMCO

The Injection Molding Company, known as IMCO, plastic containers manufacturers, has been acquired by Rexall Drug and Chemical Company for an undisclosed number of shares of Rexall stock. William Archer president of IMCO will continue as active head of the firm.

Pharma-Craft Moves Executive Offices

Pharma-Craft executive offices were moved from Cranbury, N. J., to Seagram headquarters, 375 Park Ave., New York City, on August first. Production and distribution will continue to be centered at Cranbury.

Dow Dedicates Waste Plant

The Dow Chemical Company has dedicated a six-acre incineration plant at the Midland plant. Incorporating the newest concepts in industrial waste control, the $2,250,000 chemical complex reduces air pollution, producing 1100 products in 600 buildings on a 4500-acre site.

Dow's waste treatment plants now have the capacity to handle the equivalent of sewage from a city of 300,000 and the refuse from one of 70,000—a quarter of a million pounds daily of refuse and tars, and that capacity can be doubled, if necessary.

Scovill Moves Sales HQ

Scovill Manufacturing Company has moved its eastern district sales office of the Cosmetic Container Division from New York City to the firm's main office at 99 Mill Street, Waterbury 20, Conn.; telephone, PL 4-1171; or the New York-Waterbury wire, Re 2-5911.

Dunkel Appoints Baker Co.

Paul A. Dunkel & Company, Jersey City, importers, exporters and processors of fine vegetable gums, has appointed the M. H. Baker Company as the company's representative for the entire Dunkel line in the Minneapolis area.

McNeil to Build

McNeil Laboratories has broken ground for a new plant scheduled for completion in the fall of 1960, in Whitemarsh Township, a suburb of Philadelphia.

The plant, which will be developed in phases on an 86-acre plot, will initially house approximately 450 persons, about double the present home office staff, in 200,000 square feet of space.

New Company Formed

E. J. McKernan has opened offices as a manufacturer's representative in Elgin, Illinois. The firm, called The E. J. McKernan Company, will handle Seaquist valves, as well as other aerosol packaging products.

Mr. McKernan was formerly sales manager for the Seaquist Manufacturing Corp., and has served the Continental Filling Corp. as director of research and later as sales representative covering the 17 eastern states.

Model of Stepan Chemical Company's new administration and research center to be completed next January in Northfield, Ill. The building, on a 15-acre tract, will house the executive offices, now located on Randolph Street, Chicago, and provide modern laboratories, consolidating the firm's research and development staffs. The Winnetka heliport is one mile away.

Stauffer and Victor Merge

The directors of Stauffer Chemical Company and Victor Chemical Works have agreed in principle for a merger of the two companies subject to stockholder approval, according to August Kochs, chairman, and Rothe Weigel, president, of Victor, and Christian de Guigne, chairman, and Hans Stauffer, president, of Stauffer. The merger proposal provides for an exchange of one share of Stauffer common for each share of Victor common.

The consolidation will unite Victor's extensive operations in phosphates and allied products with Stauffer's operations in basic industrial and agricultural chemicals. Sales of the combined enterprise in 1959 are expected to exceed 225 million dollars.

The Stauffer board will be expanded, according to the plan, adding three members of the present Victor directorate. The Victor organization will remain intact. Victor operations will be carried on as the Victor Chemical Division of Stauffer, with Rothe Weigel as president and general manager of the division.

Abbey Chemical Moves

The Abbey Chemical Corporation, distributor of solvents, oils, plasticizers, and organic chemicals, has moved its executive offices to Edison, N. J. The company plans to consolidate its distribution and blending facilities at this location, closing its bulk storage and terminal facilities at Elizabeth and Bayonne, on Septemper 1.

Sales Offices at Springfield, N. J., for Abbey and its affiliate, Mercury Chemical Corp. will be maintained.

National Can to Build In Vancouver, Washington

The National Can Corporation has announced conclusion of an agreement with the Port of Vancouver, Washington, for erection of a 125,000 square foot building. Construction is expected to be completed by September, which will facilitate the handling of more than 150 million cans per year for accounts in the Oregon-Washington area, in the firm's Pacific Division, which has its headquarters in San Francisco, and facilities in Los Angeles, San Leandro, Stockton, Modesto, Sunnyvale, and Santa Clara, Calif.

Alcon Opens Fort Worth Production Building

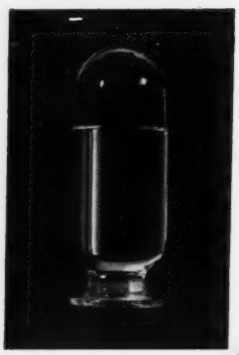
Alcon Laboratories, Inc., has dedicated its new production building on the company's 86-acre tract of land on the South Freeway in Fort Worth, Texas. The building is exclusively devoted to the preparation of ethical pharmaceuticals for the eye, ear, nose, and throat.

The production building encompasses more than 20,000 square feet of space, including manufacturing offices, warehousing and shipping facilities, as well as manufacturing processes. Construction is pending for new laboratory and administration buildings on the same site.

Gilbert Doubles Facilities

The Gilbert Manufacturing Company, custom moulder, has announced an extensive program for plant expansion that will provide over 70,000 square feet of productive capacity, doubling its present capacity. The work is expected to be completed in the near future.

Reheis Chloracel...



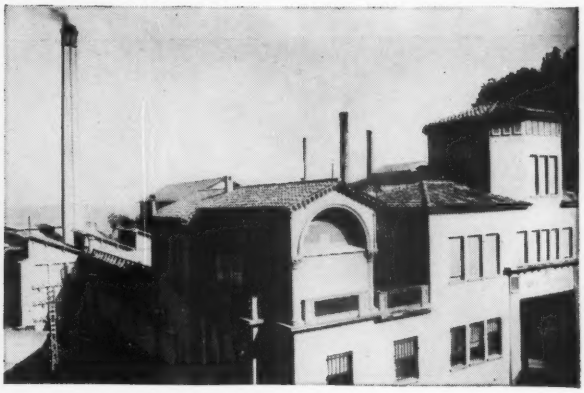
basic ingredient for anti-perspirant and deodorant sticks

Available as a 40% w/w solution for making alcohol-sodium stearate sticks, *Chloracel* (sodium aluminum chlorhydroxy lactate complex) is non-destructive to fabrics... non-irritating to skin... the first material to permit the formulation of anti-perspirant cologne-type sticks.

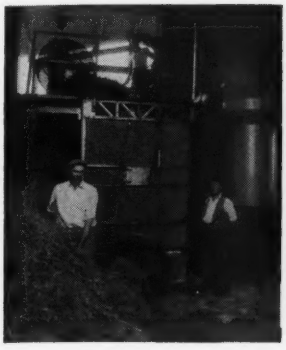
Write for complete data.

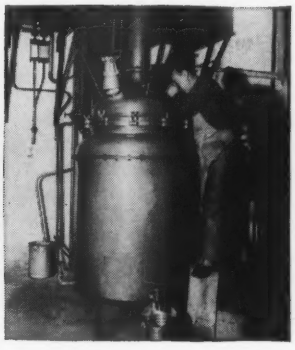
REHEIS COMPANY, INC.
Berkeley Heights • New Jersey
manufacturers of
Fine Chemicals

1653

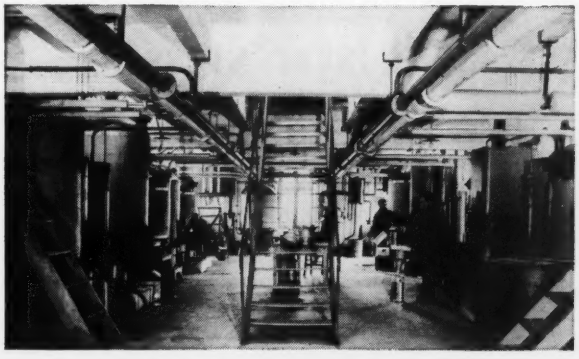
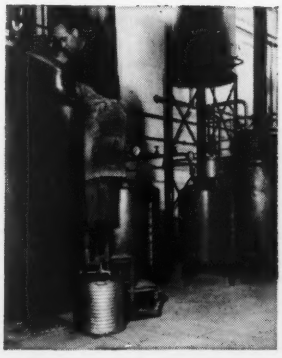


CAPACITY





QUALITY

for the finest in floral and essential oils

BERTRAND FRÈRES, INC.
443 FOURTH AVE. NEW YORK 16, N.Y.

Operator checks Sominex tablets from one of two Stokes multi-layer Model 563 tabletting presses. Stokes Model 540 high speed rotary press (in foreground) is used to make Geritol tablets.

Sominex for restful sleep...

Precisely made with Stokes multi-layer presses

Making a tablet with two distinct layers calls for precision in manufacturing. At Pharmaceuticals Incorporated, Stokes two-layer Model 563 tabletting presses were chosen to assure quality production of sleep-giving, double-tablet Sominex. Operating as long as 16 hours per day, these presses turn out Sominex with exact uniformity of granulations.

One man easily supervises operations of the presses. The possibility of jamming is eliminated through a built-in release in the pressure spring. During operation, both layers can be individually ejected for a weight check. And even after long hours of operation, Stokes multi-layer presses consistently maintain close tolerances and uniform pressures.

Whether your production involves multi-layer, press coating or single granulation tabletting operations, Stokes pharmaceutical experience and function-fitted equipment can prove profitable to you. Write or call your nearest Stokes office for a discussion of your requirements.

Pharmaceutical Equipment Division
F. J. STOKES CORPORATION
5500 Tabor Road, Philadelphia 20, Pa.

STOKES

Management Forum

BY FRANCIS CHILSON
INDUSTRIAL CONSULTANT

Time to Think

I am often impressed by the fact that so many company presidents fail to set aside a definite amount of time every day just to think. Most of them get themselves involved too deeply in the minutiae of running their business from week-to-week and month-to-month. As I have said so many times, failure to delegate authority and responsibility seems to be a universal disease. The average company president's time is taken up with too many conferences dealing with matters about which he ought not to concern himself at all. This attitude and this procedure may have been all right back in the days when drug and cosmetic firms were very much smaller than they are now. But the problems of running a business are becoming more and more complex and extensive. From this viewpoint it is obvious when you assay the calibre of the men who directed these rapidly growing industries during the past twenty-five years, that they would never make the grade during the next twenty-five. The next generation of industry leaders will be a more highly educated group of professional managers.

In view of the complexities of the problems pressing upon our industry, it seems to me that the cardinal necessity of every responsible company official is to allocate a certain portion of every day to meditate without interruption. The principal task of the presiding officer of every company is to be concerned with where the company will be five or ten years from now. To do this effectively, he must have time to think. His problems, in some instances, may be solved by luck, but luck is something no one can depend upon. It is thought that progress depends upon. Thought comes before machines or automation. It is thought that enables us to plan and to evaluate the probable results of our plans and policies.

It is a fact that, although more leisure time is available to most of us than ever before in history, there have never been so many demands upon the leisure time of those who guide the destinies of our companies as there are now. In addition to business activities, company officials are expected to participate in civic activities, in scholastic activities and in politics. All these extraneous activities go under the head of "public relations." Dozens of company officials have told me that because of these extra-business activities, they don't have time to think. But they must make time by letting go of non-essentials.

But thinking is a difficult and lonesome process. Uninterrupted time should be set aside for it every day. It depresses me when I find so many instances where no decisive action can be taken even in relatively unimportant matters unless it has the authorization of the man at the top. There are, of course, a few rare men who seem to be able to comprehend everything; to remember everything and who possess an inexhaustible fund of energy. In contrast there also are a few men in our industry who spend a substantial amount of time away from their offices, but who seem to retain a very strong grasp of the essential elements of the businesses under their direction. We need more men like this. We need men who realize that their business could be operated in its entirety by any one of a dozen men under their direction, if necessity demanded.

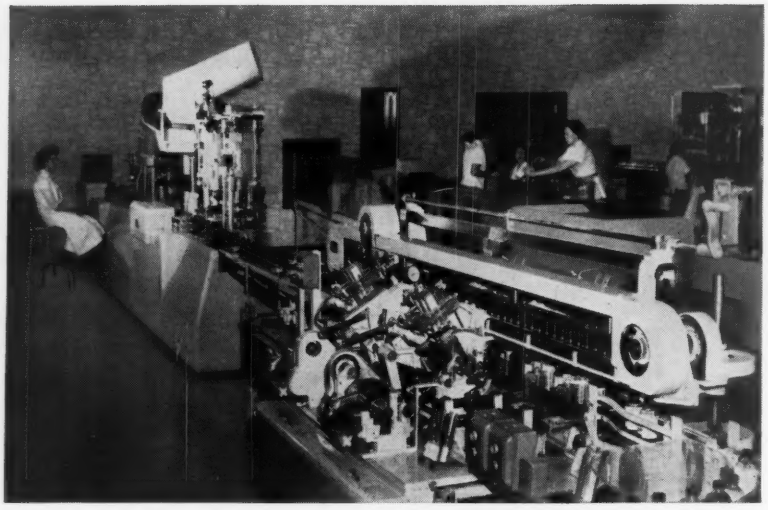
It is a pity that capable men are so seldom given the authority to make final decisions within the sphere of their responsibility. Death, as it will, comes to all men regardless of how highly placed they are, and all men in the top positions should always realize that the decisions that they sometimes find so difficult to make will someday be readily made by other men.

Famous pharmaceutical maintains commanding position

Advertisement

LISTERINE'S SUCCESS LIES IN CONSTANT UP-DATING OF PROMOTION AND PRODUCTION

• Pneumatic packaging equipment one example



High speed Pneumatic bottling line in operation at Lambert-Hudnut plant.

The promotional imagination and genius displayed in the fabulous success story of Listerine's ascent to a position of dominant leadership as a personal antiseptic has become one of the great legends of American business.

Listerine's marketing ingenuity and skill have been obvious. Less obvious, perhaps, has been the part that production methods and plant efficiency have played in making possible the maintenance of satisfactory cost and profit margins.

Part of Listerine's master plan has been constant modernization and unrelenting elimination of obsolescence. The new Lambert-Hudnut plant in Lititz, Pennsylvania, where Listerine is now produced, is an example. Here, where the most up-to-the-minute facilities prevail, Listerine operates a number of Pneumatic machines including a bottling line for the automatic cleaning, filling, capping and labeling of the three sizes of Listerine containers — three ounce, seven ounce and fourteen ounce.

This Pneumatic hook-up handles the tremendous Listerine daily production with impressive ease, and with a "lower cost per container" efficiency that has made Pneumatic equipment first choice of the leading producers in pharmaceuticals, foods, liquors, soaps, cosmetics and chemicals, to mention a few.

Early Listerine Advertisement

When you have packaging or bottling equipment on your mind, Pneumatic is the name to remember.

PNEUMATIC SCALE CORP., LTD., 70 Newport Avenue, Quincy 71, Mass. *Sales Offices: New York; Chicago; Dallas; Rochester. Agents: Fred Todt Company at Los Angeles, San Francisco and Seattle; Rockwell Pneumatic Scale Ltd., Edgware Road, London, N.W. 2, England; O.R.M.A., Paris 8, France. Subsidiaries: Delamere & Williams Co., Ltd., Toronto; Carbert Manufacturing Co., Inc., Cambridge, Mass.*

Glass Building

I have just received an interesting letter from a client whose new factory I helped to design. This building has a complete, very modern glass facade. I had nothing whatever to do with the architecture of the building. When the architect presented his sketches showing how he proposed to design the exterior of the building, I had very strong doubts about the practicability of so much glass. But I didn't offer an opinion. It wasn't asked, and as a matter of fact, I was told on the contrary, to keep my big trap shut about purely architectural matters. So I did. And this is what my client says after two years of occupancy of this gorgeous looking glass box: "It is time the experts dropped the fad for glass buildings. Ours is a pain in the neck. The only blemish in an otherwise excellent building."

Detail Lovers

Psychologists tell us that if you carefully observe a man's mannerisms you can get a pretty good line on how he operates. I have noticed over the years that in many cases those men who like to delve deeply into detail will adorn the jokes they tell with all manner of extraneous detail that have little or no bearing on the story. In short, they are lousy story tellers.

Carton Sorter

Atronic Products Inc., 1 Bala Avenue, Bala-Cynwyd, Pennsylvania, have placed on the market a carton sorter or selector which by means of a five-bar code printed on the carton will select up to thirty different items regardless of size or shape. The selector switches can be set to recognize cartons passing at a speed of 180 feet per minute. Diverters can be arranged to sort the cartons into different conveyor channels.

Vibrating Dryer

Syntron Company, Homer City, Pennsylvania, have devised a continuous vibrating dryer. The bed of this vibrating dryer consists of loosely interlocked panels which act as louvers, so arranged as to allow hot dry air to pass through the material as it cascades from one louver to another, in traveling along the channel of the dryer.

Distilled Water From Boiler Steam

I received the following interesting description of an inexpensive way of producing pyrogen free distilled water directly from boiler steam from Dr. E. T. Margolis of E. S. Miller Laboratories, Inc., of Los Angeles, California. Dr. Margolis conceived this idea in 1949. It is an original idea and it is a pity that he didn't patent it. The quotation below by Dr. Margolis is from *Science*, Volume 115.

"Although distilled water is steam condensate, condensed boiler steam cannot ordinarily be considered distilled water, because boiler steam is usually a mixture of liquid and, frequently, solid phase dispersed in small proportions in the vapor phase.

"The availability of the 'Liqui-jector,' a device for trapping entrained liquid in compressed air lines, led me to investigate the possibility of stripping entrained boiler water and solid matter from process steam to improve the quality of the resulting condensate. A unit was very kindly supplied me by George W. Jordon, Jr., of the Selas Corp. of America, Philadelphia. This was connected to a steam line, and the steam passed through it. Condensing this steam provided water with a reading varying between 0.1 and 0.3 ppm on a Solu-Bridge conductivity meter. The water was pyrogen-free, showed a negligible residue on evaporation, and otherwise met the requirements of water for injection, USP. The steam line involved was from a vertical boiler operating on full load, in which the evaporating surface was very small for the quantity of water evaporated; and the steam carried much entrained feed water.

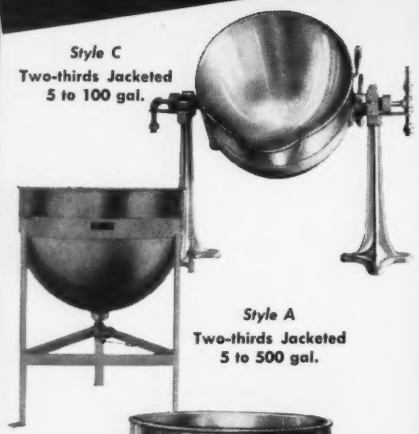
"A full-scale condensing unit was assembled and has been in continuous operation since May 1950, providing Courtland Laboratories of Los Angeles with water for biological and pharmaceutical products, directly from boiler steam. Very little attention is required; care must be taken to prevent flooding the Liqui-jector with line condensate, and the water-repellent element in the Liqui-jector must be replaced from time to time."

Deathrays and Heart Disease

Ten years ago a well-known doctor—he is medical examiner for a large industrial county—told me that seventy per cent of 3,000 odd autopsies at which he had been present during the previous 30 years, had shown no sign whatever of any form of heart disease in spite of the fact that the deaths had been conveniently diagnosed as heart failure. I asked my friend what he thought killed these people if they showed no signs of systemic damage. He said, "Microwaves." He pointed out that the air is full of all sorts of radio waves of varying wave lengths and intensities and he felt that, since the nervous system is an electrical system, people suddenly find themselves in an environment where they become, in effect, short-circuited. I asked my friend, the doctor, why he didn't publish his speculation and his answer was that he'd be thrown out of the AMA and stuck into the booby-hatch.

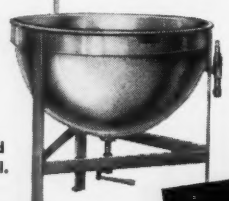
My doctor friend's supposition may however have some substance in fact. Dr. Pearce Bailey of the National Institute of Health demonstrated that he could kill monkeys with ordinary radio waves of a particular wave length. Dr. Bailey suggested that brain molecules might have ben destroyed when they "resonated" as the radiation passed through in much the same way that a tuning fork vibrates when the right note is sounded. Dr. John Heller of the New England Institute for Medical Research has demon-

COOKING KETTLES

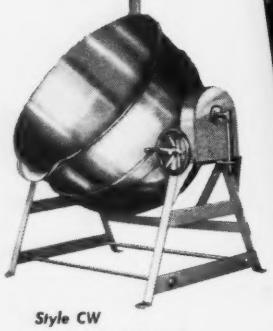


Style C
Two-thirds Jacketed
5 to 100 gal.

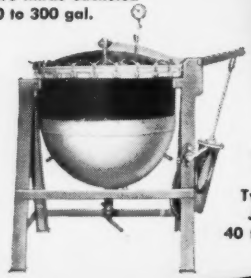
Style A
Two-thirds Jacketed
5 to 500 gal.



Style B
Full Jacketed
10 to 300 gal.



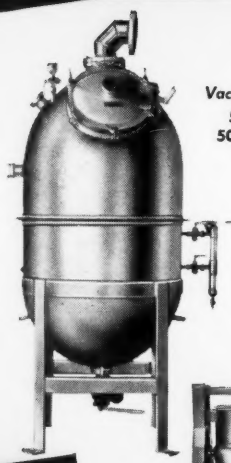
Style CW
Two-thirds Jacketed
80 to 300 gal.



Pressure Kettle
Two-thirds Jacketed
40 to 200 gal.

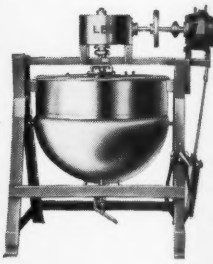
MIXING AND BLENDING UNITS

CW3T
Center-line Scraper Agitator Kettle
80 to 300 gal.



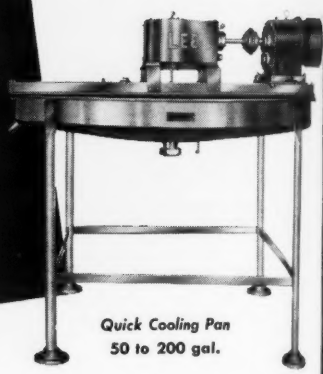
Vacuum Pan
50 to 500 gal.

D3T
Center-line Scrape Agitator Kettle
25 to 300 gal.



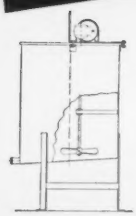
these LEE Units

WILL REDUCE YOUR PROCESSING COSTS!

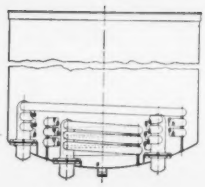


Quick Cooling Pan
50 to 200 gal.

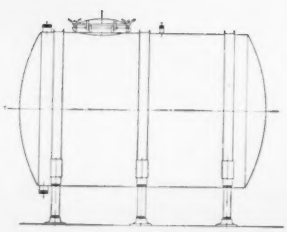
MIXING, COOKING & STORAGE TANKS



Mixing Tank
25 to 500 gal.



Pulp Tank
500 to 2,000 gal.



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Descriptive bulletins are available for any or all of the above units. Write for them today and discover how Lee can help reduce *your* processing costs.

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strated how radio waves under 50 megacycles will cause pattern changes in living cells. My friend, the doctor, may have been right after all! Perhaps our nervous system under certain conditions operates on varying wave lengths. Given a conjunction of certain radio micro-waves, conducive atmospheric conditions and a compatible nervous wave length and the individual is in effect struck by invisible, internal lightning!

Do We Really Govern Ourselves?

The Following is Published as a Public Service:

The boast is often made that we govern ourselves. But do we? Is the will of the majority always expressed? Who represents the "public interest," for instance, in a labor dispute?

The fact is that any organized minority can damage the public interest and go scot-free.

Crimes against individuals or wrongs done to them are punishable by law, but an organized group can damage the public to the extent of hundreds of millions of dollars, causing inconvenience and hardship to a community, but neither the Federal Government nor the State Government nor the city government customarily does anything about it.

For, when there is a strike affecting the lives and welfare of citizens throughout the country, such as the stoppage of operation of several airlines or of the publication of all the newspapers in the biggest city in America, no law or instrument of the law is utilized to protect the public interest.

This is not self-government. It is a form of anarchy. Indeed, it is a kind of supergovernment by a minority which, under the slogan of "the right to strike," now can override the public interest while the majority of the people appear helpless to apply a remedy.

In the last election campaign, six States sought to enact "right to work" laws so that individuals need not belong to a union in order to keep their jobs. But the labor unions spent millions of dollars for propaganda to distort the issue and to persuade many voters that the measure was really aimed at self-organization.

There is every reason to encourage collective bargaining by the workers. No provision of law interferes now or should ever interfere with the right of a majority in a plant to select their own leaders and their representatives to negotiate with the employer. But the minority have rights, too. No contract should be lawful which coerces the employer into firing any worker who, for conscientious reasons of his own, does not wish to join a labor organization.

Actually, it was the indifference of millions of citizens which defeated the "right to work" proposals in five States. Evidently the public interest must suffer a great deal more before a lethargic electorate will begin to see clearly the monopoly power usurped by the labor unions.

There is also an even more vital reason for the reform. The members of a union must not only be permitted the right of protest which goes with the right to resign from the organization without penalty, but they also must be given by law the opportunity to hold frequent elections so as to exercise a check upon leaders who do not effectively or honorably represent them.

In the strike which stopped the publication of all New York City's newspapers—accomplishing what, under the Constitution, no law of Congress may bring about, namely, the suppression of any newspaper—a flagrant weakness in our government system was exposed. This emerged also in the airline strikes. It is the failure of the public interest to attain priority over the private interest of organized minorities.

Federal mediation was applied in all these instances. But without any compelling force behind it to require acceptance it is not always effective.

Should we, therefore, enact laws providing for compulsory arbitration in labor disputes? This, too, has its disadvantages. The selection of arbitrators sometimes is affected by political influences. Confidence in arbitration is not as high as it used to be, mostly because it is not easy to be assured of impartial arbitrators. Panels of arbitrators, however, can be set up by a governmental process to overcome this difficulty.

We need laws, moreover, to provide for government seizure of plants when there is a hopeless deadlock in labor negotiations. The airlines are governed by the Railway Labor Act, which contains no provision for seizure and government operation. The Taft-Hartley Act, which does not cover common carriers, provides for court injunctions to prevent a strike only during an 80-day "cooling off" period.

While government seizure and operation in an emergency is not a desirable alternative to settlement by the parties themselves, it is better than allowing severe damage to be inflicted upon the public.

There are often, to be sure, what seem to be irreconcilable differences. The desire for equitable settlement is not always found on the side of the union or of the employer. The public has the superior right —to require continued service in an essential industry. This means, in extreme cases, an imposed settlement before and not after the damage has been done.

The American people are supposed to govern themselves. They do in most things, but apparently not where organized economic groups usurp the power of government itself.

How long are we to continue to acquiesce in domestic anarchy? When will the people really begin to govern themselves in the economic domain?

—David Lawrence, *U. S. News & World Report*, January 9, 1959.

Foster's Follies

Grand Rapids, Mich.—A teetotaler complained that he felt tipsy when he finished his job each day. The health department discovered trichlorethylene fumes were making him woozy.

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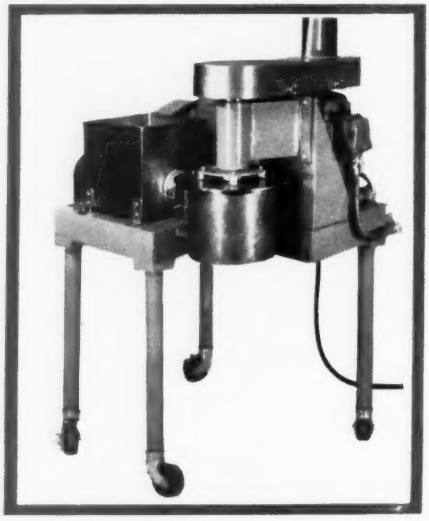

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While at his work he did not lag,
Nor did he gripe or bicker,
Yet he'd end each day with a jag,
Although he spurned all liquor.

At this some folks would not complain,
For fear they might regret it.
Instead they'd join in this refrain—
"Nice work—if you can get it!"

From the New York World-Telegram.

Pharmaceutical Packaging Equipment

The Lakso Company, Inc., P. O. Box 257, Fitchburg, Mass., has recently published a file folder describing its available pharmaceutical packaging equipment, as part of a celebration of the firm's 25th year of operation. A variety of tablet counters are each described with full illustration, also a bottle cottoning machine, a production line power unit, a tablet inspector requiring but one operator, an elevating feeder, a conveyor switching unit. The file includes reprints of articles describing machinery now in use for pharmaceutical production.

Double Deck Conveying System

The Alvey-Ferguson Company of Cincinnati 9, Ohio, has developed the A-F Double Deck Conveying System. It consists of two decks of A-F Roller Conveyor, the top deck operating counter clockwise, the lower deck operating clockwise. The roller gravity sections tilt slightly forward for easy access in loading and unloading the boxes that travel along the system to each order picker. Ball-bearing wheels along the top end of the guards relieve friction.

A conveyor operates between the lower decks of the roller gravity lines. Orders fillable at one station are placed on the belt. All orders are shunted onto the belt conveyor before reaching shipping platform where the truck is loaded.

Directly above the belt, an accessible shelf stores the most frequently needed non-bulky items. The entire system is compact and consumes little floor space. It works well for any wholesaler or manufacturer stocking medium and small items.

Imported Packaging Equipment

The Burnet Company, E. Midland Ave., Paramus, N. J., has acquired exclusive import rights to the extensive Hofliger & Karg line of specialized packaging units. The first product to be made available is the H & K Drying and Sterilizing Tunnel designed for the fully automatic drying and sterilizing of vials and ampoules, with an output to 14,000 per hour.

The vials or ampoules pass through the tunnel in a continuous three-stage process, either standing on a moving band or neck downwards on a chain conveyor; they are first dried by infra-red rays; then sterilized by a battery of infra-red lamps with heat up to 300°C.; and finally cooled to room temperature while maintaining their sterility, with ultra-violet rays.

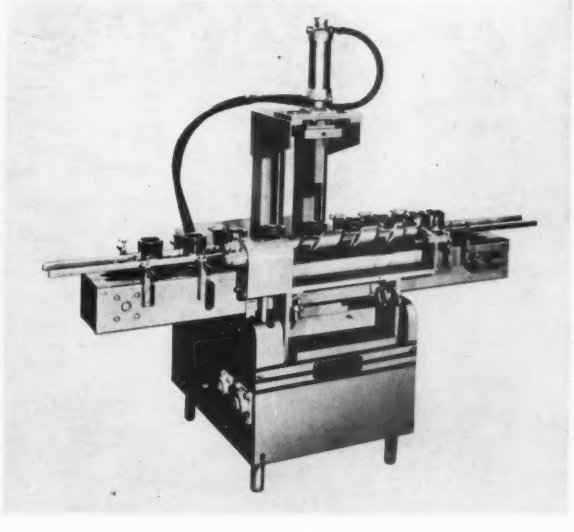
An automatic attachment can be provided to feed the vials into or from the tunnel.

Special features of the H & K unit include built-in cooling installation; air filter plant fitted with bacteria-preventive plates; fully automatic temperature adjustment; and automatic two-color temperature recorder.

Code-Embossing Production Line Machine

A new Type 22 Colton-Hope production line bottom coder that makes a non-transferable embossed code on the bottom of a metal container has been announced by Arthur Colton Company, 3400 E. Lafayette, Detroit 7, Mich. The coding process is ideally adapted to the coding of open-mouth metal containers.

Since the coding is done in the line just ahead of the filling operation, problems of pre-coding and of matching codes and containers filled are avoided.



The machine will code-emboss all sizes of open-mouth cans of from one-half pint to one-gallon capacity, at speeds from 15 to 35 containers per minute. The machine can be added to existing production lines and can be moved from one line to another, or built as an integral part of a Colton-Hope high-speed filling machine.

It includes a variable speed drive, self-aligning ball bearings, cross conveyor chain, and timing screws to feed specified size of containers. Coding dies accommodate two rows of six letters or digits each. Initials and special code insignias are also available.

Pillow Pack Imprinter

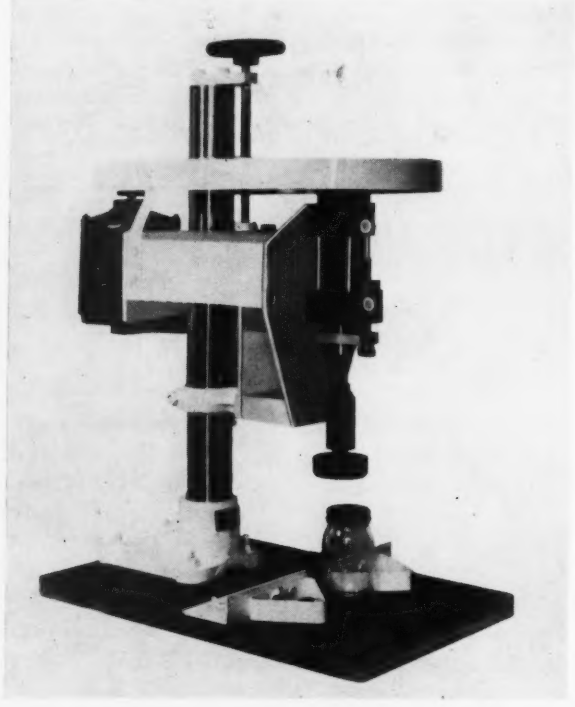
The Markem Model 45A machine for uniform identification of individually filled plastic pillow packs has been introduced by the Markem Machine Company, 191 Congress Street, Keene, New Hampshire.

Adjustable gauges enable the operator to register the imprints, and special fixtures can be supplied for ejection after marking. The 45A uses Markem air-dry inks available in a full range of colors. Printing elements are Markem rubber printing plates and individual characters or word blocks of rubber faced metal type, where frequent legend change is required.

Specifications include a maximum imprint area of 6 9/16 by 2 7/16 inches; bench mounting; ¼ horse power motor; machine size, 13 x 23 inches, height 26 inches; and shipping weight, approximately 200 pounds.

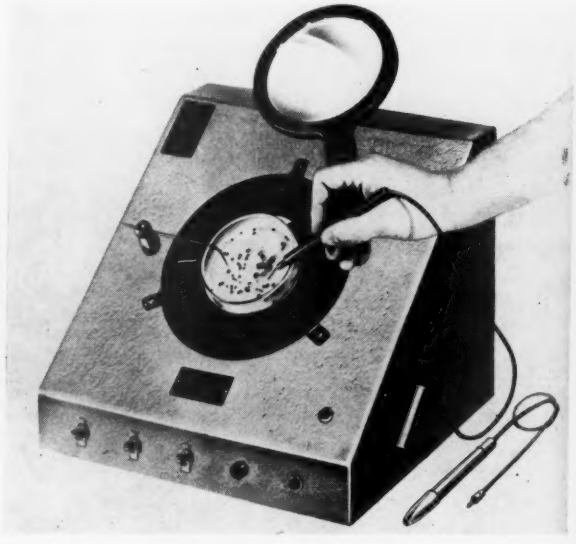
Air-Operated Screw Capper

The Scientific Filter Company, 57 Rose Street, New York City 38, has developed a new type of air operated screw capper, Model CFV, which is suitable for all sizes of lug and screw caps, molded and metalic, on glass, tin, and plastic containers.



Uniform cap tightening is secured by an adjustable friction clutch, which can provide any closing torque required, eliminates "breathers," and prevents spoilage as well as loss through evaporation. Quick-change chucks provide for immediate change-overs in cap size and type.

The Whirlwind is equipped with a special control valve which cushions the descent of the capping head, preventing damage or breakage if the container is incorrectly positioned. Speed is up to 50 per minute without operator fatigue.

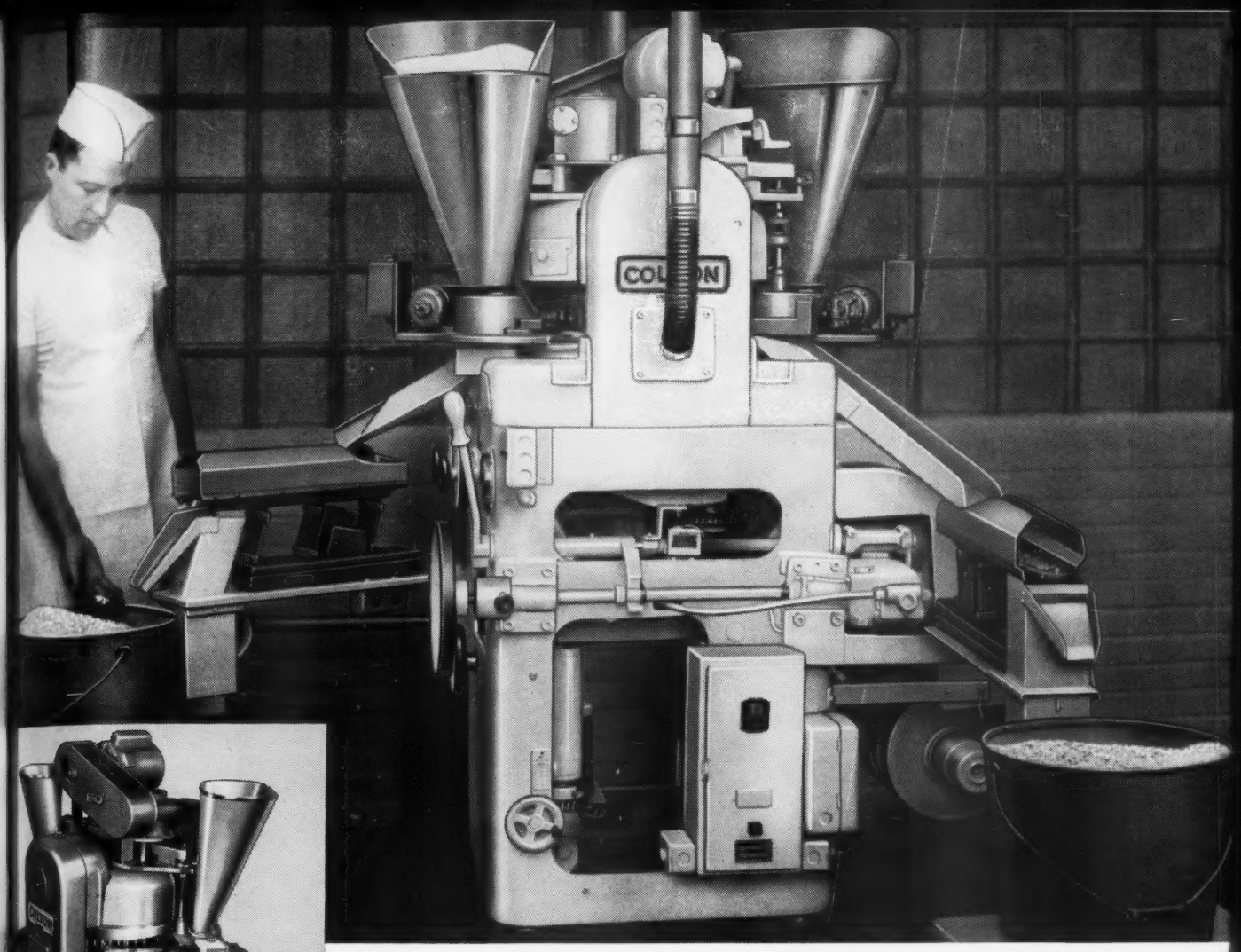


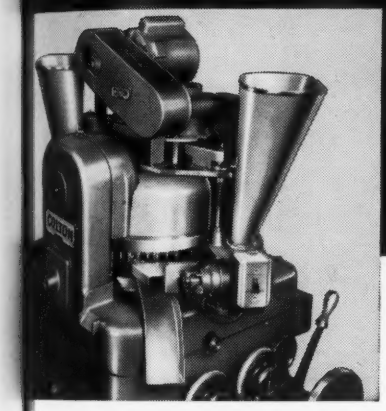
Electronic Colony Counter

Bacterial colonies can be counted and marked simultaneously in a single probing action with the illuminated Electronic Colony Counter developed by the New Brunswick Scientific Company, Inc., New Brunswick, N. J.

The counter provides the operator with four electronic counting devices: a marking probe, electric marking pen, fixed pushbutton counter, and a remote, hand-held pushbutton counter. The marking probe actuates a counting mechanism as it makes an identifying puncture in the colony. The probing is simple, fast, and accurate, avoiding duplicate counting, even in densely populated plates. The self-activating marking pen is used where puncturing is not feasible. Two pushbutton counting devices are available for sparsely populated plates, one fixed, the other hand-held. All four counting devices actuate a single, four-digit electromagnetic counting mechanism which can be cleared automatically.

Other features include fluorescent lighting, a large, adjustable magnifying viewer, and an antiseptic probe well which is removable for cleaning. Masking adapters can be provided to accommodate a variety of containers.





61.7% Jump in Production of One-A-Day Tablets when Miles Laboratories, Inc. Switched to Colton Press with Induced Die Feeding*

Jumping production from 3400 to 5500 One-A-Day Tablets per minute, a Colton No. 249 Double Rotary Tablet Press with Colton No. 245 Induced Die Feeding dramatically demonstrates the cost-cutting potential in this Colton high-production development.

At a fraction of the cost of equivalent capacity machines, this combination of Induced Die Feeding and a standard Colton press has consistently delivered, over a period of months, the additional volume required to bring up the total production of this popular Miles Laboratories' vitamin tablet.

Other results of Induced Die Feeding, the first basic advance in tableting in 30 years, are:

1. Direct tableting of many materials without granulating and with finer elegance.
2. Uniform density, accurate weight and more complete disintegration because of using powders instead of granules.
3. Positive die fill at high speeds.
4. Tablet capping and laminating substantially reduced.
5. Practical tableting of 2-layer and 2-color tablets with minor changeover.

Induced Die Feeding is available with any Colton rotary press and can be installed on existing Colton presses in 1 to 2 hours. A close-up of the mechanism is shown inset above. Your inquiries are invited. *Patents in process.

ARTHUR COLTON COMPANY

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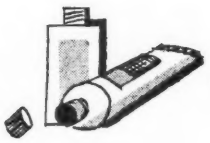

Advancing Therapy

Oral Contraceptives

Two tests of oral contraceptive tablets over the last three years by 1,000 women were reported to give a higher degree of conception control than contraceptives now used.

Although the two tests were said to indicate that the tablets were effective, they are not regarded as the ideal method of birth control.

The contraceptive is a combination of two hormones. In the tests, women took the tablets for twenty days of their monthly cycle. Menstruation was normal. Pregnancies occurred when the medication was discontinued.

The compound inhibits the anterior pituitary gland from production of the gonadotrophic hormone.

Two compounds, Enovid of G. D. Searle & Co., and Norlutin of Parke Davis & Co. were used in the study.

In "Science" for July 10, Dr. Gregory Pincus and his associates at the Worcester Fuondation for Experimental Biology in Shrewsbury, Mass., reported on the use of tablets by 830 women in Puerto Rico and Haiti over a time interval covering 8,133 menstrual cycles.

When the tablets were taken as directed, from the fifth to the twenty-fourth day of the cycle, the pregnancy rate for 100 woman-years was found to be 0.2 per cent.

Dr. Pincus summarized his study by saying:

"For the period studied, the data appear to us to answer the following questions in the manner indicated:

"Is the method contraceptively effective? Yes.

"Does it cause any significant abnormalities of the menstrual cycle? No.

"Does it adversely affect the reproductive tract and adnexae (adjuncts)? No.

"Does it have physiologically adverse effects generally? No.

"Does it affect the sex life of the subjects adversely? No.

"Does it impair fertility upon cessation? No."

A tablet that had to be taken daily cannot be considered an ideal contraceptive. The present cost of the tablets is about 50 cents each. What is sought is a pill that can be taken once or twice a year, and a compound that will not alter the body hormone chemistry in a major way.

Meanwhile, Dr. Joseph Goldzieber of the Southwest Foundation, San Antonio, Tex., said that a third combination tablet, manufactured by the Syntex Corporation, had produced "remarkable" results in a recent test with 188 women over a total of 600 months. None became pregnant and there were no side effects.

Demethyltetracycline Patent

U. S. Patent 2,878,289 was issued March 17, 1959 to J. R. D. McCormick, U. Hirsch, E. R. Jensen, and N. O. Sjolander to cover 6-demethyltetracyclines and methods of preparation. The patent was filed May 28, 1956 and is assigned to American Cyanamid Company.

This invention relates to a new group of antibiotics which are closely related to the tetracycline antibiotics and which may be produced by a fermentation process. The invention includes the new antibiotics, their salts, and complexes, the fermentation process by which they are produced and a method of recovering the new substances.

The new antibiotics are produced in a fermentation process in which mutant strains of *Streptomyces aureofaciens* are employed. The new antibiotics appear to be closely related to but are distinctly different from previously described members of the tetracycline family. They are characterized by marked stability under both alkaline and acid conditions and are superior to the tetracyclines in this respect. They have a similar antibiotic activity and may be used for the same purposes and in the same general manner as are the presently known tetracyclines.

Each of the previously known tetracycline antibiotics which are produced by fermentation with *S. aureofaciens* under particular conditions, namely tetracycline, chlorotetracycline and bromotetracycline, has a counterpart in the new series of antibiotics of the invention. The particular new antibiotic that is formed as a result of the fermentation process will depend upon the nature of the nutrient medium and other conditions of the process. With careful selections of the strain of *S. aureofaciens*, it is possible to almost completely eliminate the formation of known tetracyclin antibiotics.

The new antibiotics can be converted into epimers similarly to the manner in which the tetracyclines are converted into the quatrimycins. These epimers are also new compounds and are part of the invention.

The chlorine- and bromine-containing antibiotics may also be dehalogenated, just as are chlorotetracycline or bromotetracycline converted to tetracycline itself.

Chemical analyses and a consideration of the chemical and physical properties of the new compounds indicate that they differ essentially from the corresponding tetracyclines in having one less methyl group. Appropriate common names for these new antibiotics would be demethyltetracycline, chlorodemethyltetracycline and bromodemethyltetracycline.

One of the most important advantages of the demethyltetracycline over the previously described tetracyclines is their increased stability in acids and alkalis. The acid instability of tetracycline and the alkali instability of chlorotetracycline are well known. Chlorotetracycline in an aqueous solution at pH 9.85 has

a half life of 29.2 minutes at 23° C. By contrast, chlorodemethyltetracycline loses no more than 6 per cent of its activity in 24 hours under the same conditions. Tetracycline is completely destroyed in less than 5 minutes in 1 N sulfuric acid at 100°C. On the other hand, chlorodemethyltetracycline loses only about 2 per cent of its activity in 1 N sulfuric acid at 100° C. after 15 minutes. Similarly, the new antibiotic demethyltetracycline loses only about 33 per cent of its activity in 1 N hydrochloric acid at 100° C in 6 minutes. In 0.1 N sodium hydroxide at 50° C., demethyltetracycline has a half life of about 20 hours as compared to 3.3 hours for tetracycline. By virtue of the much better stability of the new antibiotics, it is possible to prepare many pharmaceutical products which could not be satisfactorily compounded with the tetracyclines. The increased stability also makes it possible to improve the recovery and refining processes since more drastic pH and temperature conditions can be employed, improving the efficiency of various steps.

The antibacterial activity of the tetracyclines and demethyltetracyclines is generally similar but with distinct differences. Chlorotetracycline is, generally speaking, slightly more active at a period of four hours. However, after solutions have stood for a while the bacterial growth has resumed in the case of chlorotetracycline but is still generally inhibited in those solutions containing chlorodemethyltetracycline. This is an effect of the better stability of the latter antibiotic. Similar results are observed when tetracycline is compared with demethyltetracycline and bromotetracycline with bromodemethyltetracycline. It has also been found that the demethyltetracyclines are considerably superior to oxytetracycline in the same type of test.

The demethyltetracyclines have also been compared with the tetracyclines in "in vivo" tests, and it has been found that there is no appreciable difference in the antibacterial activity of the demethyltetracyclines when compared with their corresponding tetracycline analogs. It is concluded, therefore, that these new antibiotics may be used for the treatment of the same diseases in the same general manner as the tetracyclines are now being used.

Pressure Reducing Drugs

'Darenthin', *N*-o-bromobenzyl-*N*-ethyl:*N*:*N*-dimethylammonium *p*-toluenesulfonate, is a hypotensive agent of novel type according to A. L. A. Boura et al (*Lancet* 1959, II p. 17). In animals it selectively blocks the peripheral sympathetic nervous system by action on the adrenergic nerves, in which it selectively accumulates. It does not inhibit the effects of circulating or injected adrenaline or noradrenaline. It has no apparent effect on the parasympathetic or central nervous systems.

Its effect on man has been studied in healthy volunteers and evidence of sympathetic block obtained.

In hypertensive patients it lowers the supine blood-pressure slightly and causes postural hypotension at doses which produce only trivial side-effects.

The oral dose is about five times the minimal dose effective by intravenous injection. The hypotensive response to oral administration varies between different patients, but in the individual patient the response is fairly regular and control is evenly maintained throughout the day.

The compound deserves more extensive clinical trial in the treatment of hypertension.

The drug [2-(octahydro-1-azocinyl)-ethyl] guanidine sulfates (guanethidine), given intravenously in normal and anesthetized dogs, raises arterial pressure and increases cardiac output and rate according to I. H. Page and H. P. Dustan (*J.A.M.A.* 170:1265, 1959). Long-term treatment of dogs with renal and neurogenic hypertension lowers blood pressure sharply, the more so in the latter group. The hypotensive effect is prolonged.

Treatment of 18 hypertensive patients with guanethidine shows it to be an effective hypotensive agent, with mild diarrhea as the only side-effect so far noted. The fall in arterial blood pressure is slow and prolonged, often with postural hypotension preceding normal supine pressure. Bradycardia commonly occurs.

Hexahydro-1-azepinepropionamidoxime dihydrochloride was a much less effective antihypertensive agent. The chemical structure and mechanisms of action of guanethidine differ from those of other antihypertensive agents.

Levomepromazine

L. Telatin (*Minerva med.* 50:166, 1959) reported on the effect of Levomepromazine, a new phenothiazine derivative, on psychiatric patients.

Levomepromazine had an hypnotic effect on all the patients; on the average, the morning and afternoon doses induced sleep for 2 or 3 hours, and the evening dose was followed by sound sleep the entire night. The sleep was not disturbed (as frequently happens with chlorpromazine or reserpine) by painful dreams or nightmares. The drug did not cause any disturbances or unpleasant sensations. A rapid improvement in behavior, decreased agitation, and a return of logical speech were observed in patients with schizophrenic syndromes.

The good effect of Levomepromazine in patients who benefited from the drug became manifest early. When there was no sign of improvement during the first 15 days of treatment, the patients usually failed to derive any benefit from the drug. Levomepromazine had a good effect on the general condition of the patients, causing an improvement in appetite and being well tolerated. It had no toxic effect. Various tests always gave negative results.

Tofranil (Geigy), generic name imipramine hydrochloride, chemically, 5-(3-dimethylaminopropyl)-10, 11-dihydro-5H-dibenz (b,f) azepine hydrochloride, is a new drug for the relief of depression. It is described as a "thymoleptic" because its specific action is to ameliorate pathologic depressive states; it is not a specific central nervous system stimulant. The preparation is available in sugar-coated, coral-colored tablets, 25 mg. each in bottles of 100 and in ampuls for intramuscular administration, each containing 25 mg. in 2.2 cc. of solution in cartons of 10 and 50 ampuls.

Nardil (Warner-Chilcott) contains in each tablet 15 mg. of phenelzine dihydrogen sulfate, betaphenethylhydraxine, a fast acting non-toxic monoamine oxidase inhibitor, for the treatment of mild and severe depressions. The preparation is supplied in bottles of 100 and 5,000.

"I need help—from someone who's been in fatty acids from the beginning!"

To the fatty acid user, the experience of his supplier in the servicing of customers, and in the manufacture and marketing of fatty acids, can mean the difference between a top-notch product and an also-ran.

Consistent high quality of an end product such as a soap or a cosmetic starts with the vegetable oil, tallow or other crude raw material from which the fatty acid is made. A supplier must know his raw material market thoroughly — what to buy, where to buy, when to buy—because he is purchasing natural materials that vary with environmental factors. Long experience here is an invaluable asset in purchasing for maximum uniformity and quality of the ultimate fatty acid, and so of the final end product.

Given the best raw materials, the fatty acid supplier must then analyze them to determine his procedures for optimum production results. Analytical tests alone are not enough. Experience is necessary to evaluate and interpret the tests, to correct for deviations in even the best raw materials. Only by anticipating and recognizing irregularities can steps be taken for their elimination.

Following tests and evaluations, the fatty acid supplier must know how to process his raw materials for the most uniform results. An experienced producer has facilities flexible enough to handle the variations inherent in his raw materials, and still turn out products which adhere to exacting specifications—batch after batch, shipment after shipment. This uniformity assures the fatty acid user that he will get maximum performance in his own manufacture.

An intimate acquaintance with all his markets is essential if a supplier is to provide fatty acids which give best results in any particular end product. An experienced supplier has a standard product line that has actually been tailored to the needs of users over many years. And he sees to it that these products are improved constantly to meet new needs.

Finally, the supplier must know what to do in emergency situations arising in his customer's plant. Only long years of dealing with every conceivable type of customer problem can give him that knowledge.

A. Gross & Company has been making fatty acids since they were introduced — has encountered every type of customer requirement, has assisted in solving an enormous variety of customer problems, has a long-established knowledge of what to buy and sell to give best results in customer end products.

We would be pleased to discuss your fatty acid requirements with you. For information on A. Gross fatty acids, such as **Groco Heat-Stable Red Oils & White Oleines,** send for the brochure "Fatty Acids in Modern Industry."

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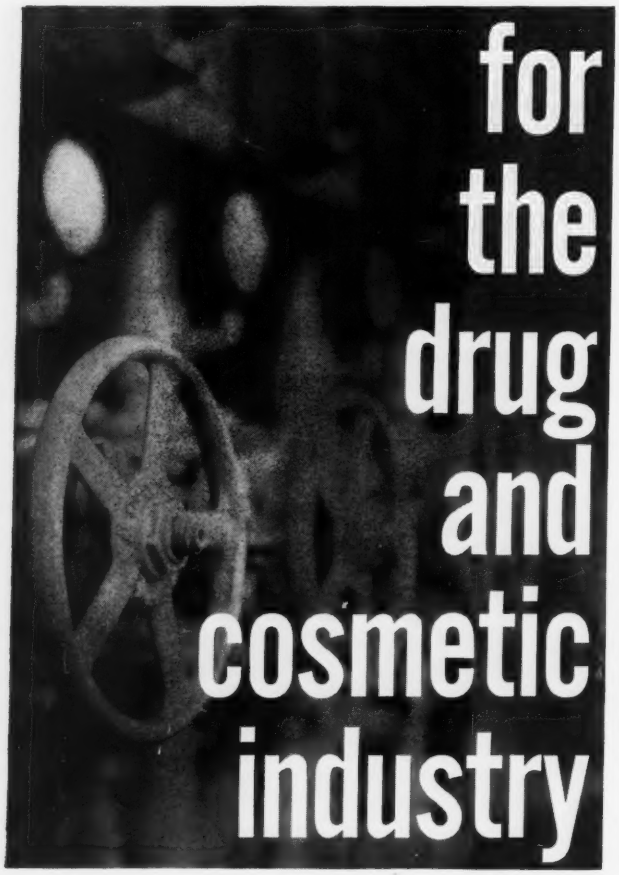

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Compounder's Corner

Sustained Release Drugs

Oral sustained release preparations should demonstrate a period of relatively constant excretion rate at a level which is reached by a usual single dose of the drug and for the period for which a claim is made. Such products must also be physiologically available in terms of the drug itself.

The present studies by K. G. Shenoy, D. G. Chapman, and J. A. Campbell (*Drug Standards* 27:77, 1959) are an attempt to apply these proposed criteria to representative "sustained - release" amphetamine preparations on the market at the present time and to develop further an approach to this very complex problem.

Nine male human subjects volunteered for the *in vivo* studies.

Eight commercially available capsules labeled as being of the sustained release type and containing amphetamine were obtained for study. All of the products contained dextro-amphetamine sulfate (*d*-amphetamine sulfate) except product H which contained amphetamine sulfate (*dl*-amphetamine sulfate). For each subject data were obtained on the blank urinary excretion prior to the ingestion of the drug, on the urinary excretion following the ingestion of the pure drug taken in solution in both the *d*- and *dl*-forms and on the urinary excretion following the ingestion of the sustained release capsules containing amphetamine. Determinations were made on urine samples collected at the following intervals from the start of the test: 2, 4, 6, 8, 14.5, 24, 28, 32, 38.5, 48, 52 and 56 hours.

For the *in vitro* studies, the capsule contents were placed in 4-oz. bottles which were revolved end over end at 12 r.p.m. in a constant temperature bath at 37°. Simulated gastric juice was used for the first 30 minutes followed by simulated intestinal juice. The composition of the juices was that of the U. S. P. XV. At appropriate intervals, 15, 30, 45, 60, 120, 180, 240, 360, and 420 minutes, 20-ml. aliquots were withdrawn. These aliquots were assayed for amphetamine using the same method as for urine.

Dextro-amphetamine sulfate was excreted to the extent of 52.2 per cent while after the ingestion of amphetamine sulfate, 69.8 per cent of the dose was recovered in the urine in 56 hours.

From 14.6 to 55.4 per cent of the dosages taken in the *d*-form in the commercial products was recovered in the urine. These amounts corresponded to 28 to 106 per cent availability, assuming that the 52.2 per cent of the standard excreted was equivalent to 100 per cent availability. Following the ingestion of product H which contained the *dl*-form, 70.3 per cent of the dosage was recovered in the urine resulting in 101 per cent availability.

There appeared to be four distinct types of release in the preparations tested. The excretion rates of products A and B were essentially the same as dextro-amphetamine in solution, demonstrating that these preparations gave no evidence of sustained excretion. Both were fully available. Excretion curves of products C and D exhibited no sustained effect and reached approximately the same rate as the standard, in 30 to 36 hours.

Preparations E, F, and G exhibited some type of prolonged excretion past that of the standard amphetamine. The differences between them lay in the level at which the rate was sustained. Product F showed a constant excretion rate for about 20 hours and was quantitatively available. The rate of about 3.5 meg. per minute is one which would be reached with a usual single dose of the drug. Product E exhibited a prolonged half-life with a somewhat lowered peak excretion and full availability. Product G yielded constant excretion, but at low level resulting in an availability of only 51 per cent.

Product H, containing amphetamine sulfate, also exhibited constant urinary excretion rate for about 24 hours and was fully available.

In vitro release data over a period of 7-8 hours was obtained on the same products. There appeared to be a relationship between the *in vitro* releases and availability, but this relationship cannot be too clearly defined. Product F, for example, released only 34.3 per cent of its amphetamine *in vitro* in the first hour and yet its availability of 94 per cent would be considered to be quite satisfactory. Products C and G on the other hand, released 26.7 per cent and 26.5 per cent of the dose *in vitro* within one hour, but the *in vivo* availability amounted only to 52 per cent and 51 per cent respectively.

Of the 8 commercial products labeled as having sustained release, only two, F and H, exhibited constant urinary rates of excretion over an extended period of time and were quantitatively available. There was little evidence that the other products had a sustained effect, since either their rate of excretion curves were quite similar to that of the standard dextro-amphetamine taken in solution, or they were simply unavailable. Whether or not a product exhibits a sustained-action effect, its active medicaments should be available to the consumer when ingested as directed. Products, C, G, and D did not meet this criterion although product G exhibited a constant urinary excretion rate at a low level for approximately 24 hours.

By mixing different proportions of pellets of varying disintegration times it should be possible, using the urinary excretion technique, to determine quite precisely what amounts of *in vitro* released drug

constitute sustained release *in vivo* and what do not. These are the limits which must be defined in any satisfactory *in vitro* test. It would appear that urinary excretion data would be most useful as a means of standardizing such tests, which, by themselves are meaningless.

The clinical effect of a drug is usually related to concentration of the drug in the body which in turn is proportional to the rate of excretion. Since the available dose of the drug in these preparations ranged from about 5 mg. available over an extended period in Product D, to 15 mg. available at once in product A, it would be expected that there would be marked difference in clinical response to products which are labeled as being similar. This, in fact, was found to be the case. Subjects could detect no effect from the former preparation, but most received a marked "jolt" from the latter. This is obviously a most unsatisfactory situation for the physician who may find it necessary to substitute one product for an apparently similar one. It is concluded that present methods of testing these preparations are in great need of development.

Comment: A good idea like sustained action dosage forms is obviously easier to talk about than to put into usable form. Even more important, this report again emphasizes that laboratory studies cannot give the final answer, which must come from consumer use tests. J.K.

Amino Acid-Fatty Acid Salts

Information and samples of amino acid-fatty acid salts with potentially valuable properties are available from Biochemicals Development, General Mills, Inc., Central Research Laboratories, Minneapolis 13, Minn. Monobasic salts have been made from *l*-arginine and the fatty acids caproic, caprylic, capric, lauric, myristic and from safflower seed oil fatty acids. The caprylate and the safflate salts are available in developmental quantities, the others on a research basis. Correspondingly, salts have been made from *l*-lysine and caprylic, capric, lauric, myristic, and safflower seed oil faty acids, the laurate, myristate and safflate in developmental quantities.

These waxy to crystalline solids are soluble to the extent of only 0.01 per cent up to 70 per cent in water and some of them reduce surface and interfacial tensions substantially. Although safflower seed oil fatty acids quickly undergo oxidative rancidity, the corresponding amino acid salts are very stable. As expected, solubility is greater with shorter chain fatty acids, emulsifying and surface tension reducing power greater with the long chain acids.

With emulsions simply made by hand shaking mixtures of equal volumes of corn oil and water, with the amino acid soap as the emulsifying agent, lysine myristate at 6 per cent and arginine safflate at 4 and 6 per cent gave emulsions of considerable stability. Experiments were not reported on the use of homogenizing equipment, or the use of auxiliary emulsifiers like glycerin and glycol fatty acid esters or fatty alcohol ethers. These new soaps might be even more useful in these circumstances.

Tentative toxicity studies have been mare; it's not surprising that on intravenous injection these soaps were toxic, since ordinary soaps are strongly hemolytic and toxic under these conditions.

Oral toxicity studies on mice indicated toxicity at rather high feeding levels, perhaps due to the apparent distate of the animals for the food and consequent starvation. No studies of topical irritation or sensitization were made.

Stable Penicillin Salts

Stability studies of the dry powders by G. N. Vyas and S. G. Dhopate (*Antibiotics and Chemother.* 9:203, 1959) indicated that members of the series from N,N′-diethyl- to N,N′-dioctylethylenediamine dipenicillin G are stable for one year or more at room temperature. At 37°C., N,N′-diethyl-, N,N′-dibutyl-, and N,N′-diisoamylethylenediamine penicillin G salts were stable for at least one year.

From the stability studies in aqueous suspension at room temperature for 10 days, it may be noted that the rate of deterioration decreased as the length of the alkyl chain attached to the nitrogen atoms of ethylenediamine increased. The N,N′-dihexyl-, N,N′-diheptyl-, and N,N′-dioctylethylenediamine penicillin G salts deteriorated least, the percentage of deterioration being minimum with N,N′ - diheptylethylenediamine. All three deteriorated considerably in three months at 37°C.

In general, the salts wesre quite stable at *p*H 6 and 8 for up to six hours. At *p*H 4, all of the penicillin salts, except those of N,N′-dimethyl- and N,N′-dilaurylethylenediamine, are fairly stable for one-half hour, and the penicillin salts of N,N′-diethyl- to N,N′-dioctylethylenediamine to a lesser degree for three hours. In general, stability increased as the alkyl chain attached to the two nitrogen atoms of ethylenediamine increased; N,N′-diotylethylenediamine penicillin salt seemed to be the most stable. At *p*H 2, the rates of destruction of all the penicillin salts, except those of N,N′-dipropyl-, N,N′-dihexyl-, N,N′-diheptyl-, and N,N′-dioctylethylenediamine, were comparatively high, even within one-half hour.

At *p*H 2 and 4, the behavior of N,N′-dihexyl-, N,N′-diheptyl-, and N,N′-dioctylethylenediamine dipenicillin G compares with that of benzathine penicillin G, with N,N′-dioctylethylenediamine dipenicillin G coming closest with respect to penicillin blood levels and stability at different *p*H values. N,N′-Dioctylethylenediamine G also shows a powerful prolonged antihistaminic effect.

Hexametaphosphate Bath Salts

E. R. Gross (*A.M.A. Arch. Dermatol.* 80:99, 1959) advocates the use of sodium hexametaphosphate as a soothing bath additive in the treatment of dermatoses and inflamed skin and believes that it is conducive to restoring the protective acid mantle of the skin. It is a nonirritating water-softener, compatible with soaps and detergents, imparting a soft, silky feel to the water.

Comment: The application of this compound to bath preparations is almost too obvious to be underlined.

Sunscreening Composition

U. S. Patent 2,880,140 was issued on March 31, 1959 to Maison G. de Navarre, assigned to Beauty Counselors, Inc., and relates to cosmetic preparations containing beta-resorcylic acid, its salts, esters, amides and organic derivatives to screen out light rays that cause burning, but to pass those that cause tanning. With so eminently qualified an inventor, the sunscreen compound can't help but be good.

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Perfumer's Shelf

Heptaldehyde

Heptaldehyde is the starting point for the manufacture of a product which has assumed a position in the first rank among synthetic aromatics alpha cinnamic aldehyde. It is prepared by the condensation of heptaldehyde with benzaldehyde in the presence of alkali. It has an intense floral odor of the jasmin type and provides that basic, buttery jasmin note which had previously been attainable only by the use of jasmin absolute itself. Small amounts are valuable in many other floral types. It is stable in soap, where it produces a powerful effect, yet without predominance.

Heptaldehyde, upon condensation with malonic acid, yields a mixture of two isomeric nonenoic acids, one of which, treated with sulfuric acid in a manner the same as used with undecylenic acid to produce gamma-undecalactone, yields gamma-nonalactone, known variously as coconut aldehyde or aldehyde C-18. It has a powerful persistent odor suggestive of coconut and is used in strong and heavy florals such as gardenia and tuberose, as well as in flavors, particularly the coconut type. The other of the isomeric nonenoic acids yields upon esterification with methyl alcohol the ester methyl nonenoate. It has a violet-lilac character. Used in high-quality perfumes, in small quantities, it creates a superb violet-leaf character.

Heptaldehyde may be reduced easily to heptyl alcohol, or alcohol C-7, which has been found in oil of cloves. It has a light fatty odor which finds use in carnation and jasmin types, as well as spicy and Oriental scents. The chloride of the alcohol, condensed with ethyl acetoacetate followed by hydrolysis yields methylheptyl ketone, a product with a characteristic odor of oil of rue which has been found in oil of clove, rose and rue. It is useful in the blending of lavender and eau de cologne perfumes, and in all formulations calling for rue oil or methyl nonyl ketone, where its individual note is highly desirable.

An unusually interesting member of the family of products derived from heptaldehyde is methylheptine carbonate. It has an overpowering odor in the pure state but in proper dilution the odor is similar to violets. In small quantities it produces an exquisite violet or violet-leaf effect, blends well with ionones and other violet notes, is long-lasting and has good fixative value.

Perfuming Deodorants

It is possible to use almost any type of perfume in deodorants, according to V. Vasic (*Manuf. Chem.* 30:237, 1959) so long as the components are non-irritating to the skin. The perfumes must emphasize the impression of cultivated cleanliness and the odor should not be so heavy as to compete with other perfumes worn by users. The refreshing odors of rose, lavender, etc., or more subtle combinations of fancy bouquets, are most useful. Products intended for men only are also perfumed with citrus colognes and aldehydic colognes.

The perfume materials to be used in antiperspirants must be stable under acid conditions.

Essential oils which contain large amounts of terpenes must be avoided because they will resinify after some time. Essential oils which contain a high proportion of esters, such as bergamot and lavender oils, should also be avoided. Linalyl acetate is destroyed to a more or less large extent after some time.

Occasionally a perfume will cause bleeding or separation in an otherwise stable antiperspirant cream. The perfume must be checked in the cream, even if it is compatible with the individual ingredients of the cream.

In deodorant preparations the perfume often must cover not only the odor of basic fatty materials, but also the odor of the antisepetic which might be incorporated.

In compounding a perfume for deodorant preparations containing quatenary ammonium compounds it must be borne in mind that some of these materials may have a deleterious effect on a perfume composition.

While the color of most perfume materials is unaffected by hexachlorophene, some discolor a little.

A perfume for a deodorant stick must contain only ingredients which are stable in a slightly alkaline medium. Perfume containing ingredients sensitive to alkali may be affected in various ways by the soap gel. On aging of the stick the fresh top notes may disappear and the perfume may develop an unpleasant character. The color of the stick may darken due to the action of alkalis on some perfume ingredients. The possible influence of the perfume on the properties of the alcohol gel should not be ignored, because certain perfumes may affect the stability of the gel, resulting in bleeding of the stick.

Although polyethylene containers are inert to spray ingredients, they are somewhat permeable to many perfume ingredients. The nature of the cosmetic vehicle plays a strong role in determining the rate of permeation. Alcoholic preparations lose less perfume than preparations in mineral oil or water. It is therefore important to select such perfume ingredients in the compounding of a perfume which shows the least diffusion through the container.

It is of very great importance that every component of a perfume intended for perfuming deodorants or antiperspirants (or products having both qualities) is free of irritating qualities, because these products are in long contact with the skin, especially with areas which are extremely sensitive. All known perfume irritants must be avoided, but other materials used in the preparation of deodorants and anti-perspirants may also cause irritation and they must be fully tested before use.

The concentration of perfume varies according to the type of product. For deodorant creams or emulsified lotions the recommended concentration is 0.5 per cent. For aqueous alcoholic type deodorant products a concentration of 2.5 per cent of perfume oil at cologne strength is recommended. The concentration of perfume in deodorant sticks is from 2 to 4 per cent, usually 3 per cent.

Musk Odor

The musk note is one of the essential elements in modern perfumes and can be successfully achieved by choosing from a variety of pure chemical compounds of diverse structure as well as from products of natural origin. Judging from the increasing activity in the field of synthetic musk research, we may predict that new and valuable members of this class will continue to be discovered.

Apart from their peculiar fragrance, the musks have a remarkable fixative power; they permit perfumes into which they are incorporated to keep the same note during most of their evaporation.

In addition to their fixative power, the musks are able to harmonize a perfume composition: they give the odor of more "rounded" note without their own note being necessarily perceptible. Finally, they are capable of exalting a perfume, of amplifying the odor in some way.

The odorous principle of ambrette seeds was studied by Kerchbaum who established the structure of ambrettolide. It is an unsaturated lactone having 16 carbon atoms forming a ring; hence the name macrocyclic musk was given to this species of products. It is interesting to note the essential difference existing between the natural plant and animal macrocyclic musks: the first are lactones, while the second are ketones.

Stevens and Erickson established that the odorous secretion of muskrat scent glands was composed principally of cyclopentadecanol and cycloheptadecanol, as well as corresponding ketones, the latter being much more odorous than the alcohols.

Toward the end of the last century, Baur synthesized a product having a musk odor—trinitrobutyltoluene.

The discovery of trinitrobutyltoluene was rapidly followed by that of musk xylene, musk ambrette and musk ketone which were, and still are, masterpieces in the perfumery arsenal.

In 1932, H. Barbier discovered Moskene while reacting paracymene and tertiary butyl alcohol, then nitrating the compound thus obtained. Five years later, Carpenter prepared Musk Tibetene which is dinitrotrimethyl-tert-butyl benzene.

In 1940, Bruson and Kroeger showed that 2,5-dichloro-2,5-dimethylhexane could be condensed with toluene to give 1,1,4,4,6-pentamethyltetra-hydronaphthalene. Carpenter observed that acetylation of this product led to a derivative having a strong musk odor. It was the first member of a new series of synthetic musks, the polycyclic ketone musks. The advantage presented by this compound was the absence of "nitro" groups which are the source of decomposition and discoloration in the first synthetic musks.

To this series belongs *Versalide* which is 1,1,4,4-tetramethyl-6-ethyl-7-acetyl-tetralin.

—P. Bachman, *The Givaudanian*

Cream Sachets

Emulsified sachet must be greaseless in character and, if liquid in form, should be of very heavy consistency according to W. Wynne (*The Givaudanian*). This high viscosity also gives the product greater cosmetic appeal. Not too much difficulty is encountered in making the solid cream sachet from the standpoint of stability of the emulsion. However, the liquid emulsion creates the problem of the consistency of the emulsion, as well as its stability. One formulation may work splendidly with one perfume compound, but substituting another perfume compound may either make the resulting product entirely too thin to be satisfactory, or so heavy that it cannot be poured. In the case of the solid cream sachet, one formulation is adaptable to the use of many perfume compounds, but for the liquid cream sachet the perfume compound has to be tailor-made for each different type of sachet formulation.

Changes in the ingredients of the perfume compound may occur either by oxidation, hydrolysis or polymerization. These changes occur more readily when the emulsion is on the alkaline side.

Gradual discoloration of both the solid and the liquid cream sachet is another serious difficulty encountered. If the emulsion is kept on the acid side, with a *p*H between 5 and 6, discoloration is greatly reduced.

Hydrophilic waxes such as glyceryl monostearate or diethylene glycol monostearate in combination with ammonium lauryl sulfate form exceptionally fine emulsions. Liquid emulsions are of the oil-in-water type, containing between 80 per cent to 85 per cent of water. Cetyl alcohol and myristyl alcohol are used in varying concentrations to control consistency. In cases where the problem of stability of the emulsion proves to be a difficult one, the use of water-dispersible colloids is resorted to.

Perfumes should be added to the emulsion at the lowest possible temperature. In the case of the solid cream sachet, the addition of the perfume compound when the cream has reduced to about 50°C. does not generally present any problem. However, in the liquid cream sachet, where the concentration of the perfume compound amounts to about 50 per cent of the oil phase of the emulsion, the formula must be adjusted to avoid trouble.

Chamalia

A new fresh floral bouquet fragrance called "Chamalia" was introduced recently by Aromatic Products, Inc., New York. Its fresh, clean scent is particularly suited for cosmetics—creams, powders and lotions—as well as soaps, detergents and air fresheners.

Vistaril Oral Suspension (Pfizer) is a lemon-flavored liquid dosage form of the psychotherapeutic compound hydroxyzine pamoate. Each 5 cc. teaspoonful contains 25 mg. of the drug and the preparation is supplied in one pint amber bottles.

Tenuate (Merrell), a brand of diethylpropion, 1-phenyl-2-diethylamino-1-propanone, is an apetite-curbing drug said to have no central nervous system side effects. It is available in 25 mg. tablets in bottles of 100 and 1,000.

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Trade Literature

Industrial Chemicals

Commercial Solvents Corporation, 260 Madison Ave., New York city 16, has published a new price schedule of its industrial chemicals. P. S. No. 49 lists prices by the gallon, the pound or unit for tank car, carload and less than a carload, along with telephone numbers of the firm's representatives in the various cities.

Prescription Chemicals

A new price listing of its chemicals for medicinal, photographic, analytical and industrial uses has been issued by Mallinckrodt Chemical Works, Mallinckrodt Street, St. Louis 7. The 128-page booklet lists the complete line alphabetically, giving price per pound and per package. It provides also the addresses and telephone numbers of its sales offices here and in Canada.

Liquid Filling Machines

Bulletin #659F from Popper & Sons, Inc., 300 Fourth Ave., New York City 10, describes its complete line of automatic liquid fillers, which has recently been extended, and is in use in the drug, chemical, cosmetic, and allied industries.

Fatty Acids

Fatty Acids in Modern Industry is the title of a 26-page brochure published by A. Gross & Company, 295 Madison Ave., New York 17. It provides a convenient listing of normal specifications for those basic fatty acids manufactured by the firm, and the names and addresses of distributors both here and in Canada and Mexico.

Aromatic Chemicals

Polak & Schwarz International., N. V., Zaandam and Hilversum, Amsterdam, The Netherlands, has put out a 16-page price list, Aromatic Chemicals, 1959, No. 1. Also included is a description of Jasmelia Extra, offered for use in fine jasmin-based perfumes.

I.C.C. Aerosol Regulations

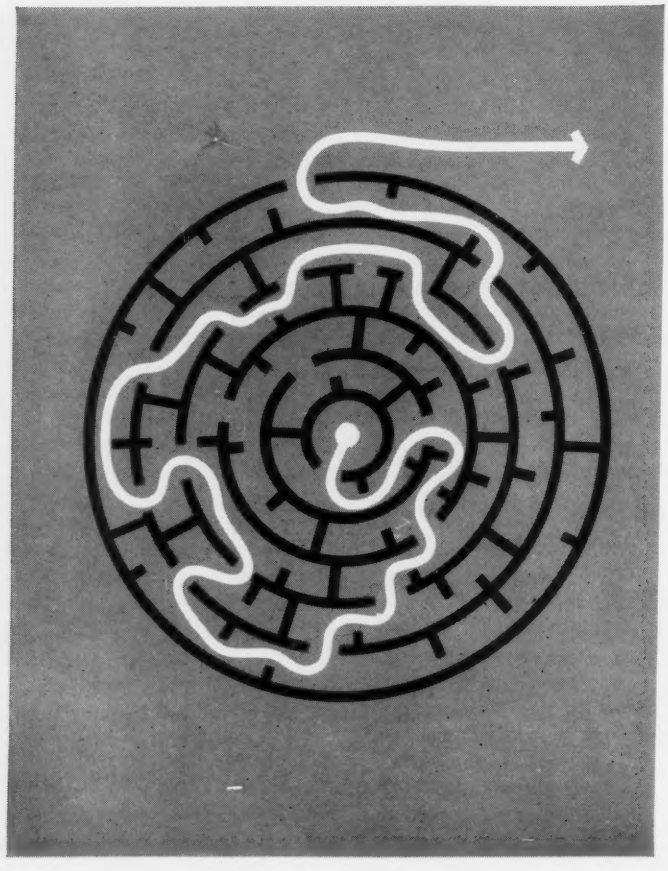
Pennsalt Chemicals Corp., 3 Penn Center, Philadelphia 2, Penna., has tabulated the latest information available on I.C.C. regulations governing the shipping of aerosol containers, from H. A. Campbell's Tariff #10 (6/19/57) and subsequent modifications or revisions, through November 15, 1958. The information is presented in charts, making specific requirements easy to locate.

Acetophenone

New data on the reactions and pharmaceutical applications of acetophenone are outlined in a 12-page bulletin issued by Union Carbide Chemicals Company, 30 East 42nd Street, New York City 17. Physical properties, shipping data, specifications, solubility, applications, typical reactions, and physiological properties are described.

Acetophenone is widely used for its solvent and odorant properties, and because of the reactivity of its atyl, carbonyl and methyl groups, as an intermediate in synthesizing a broad range of compounds.

(Continued on page 271)



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Industry's Books . . .

Medicinal Chemistry, Volume IV, Barbituric Acid Hypnotics, *edited by F. F. Blicke and R. H. Cox, under the authorship of Wilbur J. Doran, 334 pages, John Wiley & Sons, Inc., (New York), cloth,* **$12.**

This is another in the series of reviews prepared under the auspices of the Division of Medicinal Chemistry of the American Chemical Society. In the preparation of this review, literature has been covered through 1956, with an attempt to include all barbituric acid derivatives disclosed and to cover pharmacological data wherever possible. Each barbiturate has been listed in one or more tables, with systematic arrangement and tabulation to facilitate location of data. Trade and generic names, and molecular structure, for compounds of therapeutic importance are given in the Addenda. The monograph covers the broad divisions of Chemistry, Pharmacology, Distribution and Metabolism, and Regulation of Sale. The quality of all members of this series is high, and is maintained in this new volume, which should be part of every medicinal chemistry library.

X-Ray and Radium in Dermatology, *by Bernard A. Wansker, M.D., Diplomate, American Board of Dermatology, 114 pp., Charles C. Thomas, Publisher, Springfield, Ill., Cloth,* **$5.**

The purpose of this monograph is to present in a short succint fashion the scope of roentgenology as it applies to the treatment of skin disorders. It begins with the physics of radiation which is presented without the use of calculus and formulae. The x-ray circuit is fully discussed and adequately but simply illustrated. Physical factors affecting the quality and quantity of x-irradiation are explained in some detail. Filtered x-ray techniques and low voltage (superficial) therapy are discussed and selected specific methods of therapy are presented in complete form. Chapters on contact, grenz and cathode rays are also included. The use of radium and radioisotopes is presented both from the theoretical and practical point of view.

The Clinical Evaluation of New Drugs, *by Fourteen Authors and Edited by S. O. Waife, M.D., and Alvin P. Shapiro, M.D., 223 pp., Paul B. Hoeber, Inc., (1959), cloth,* **$7.50.**

This book presents the methods and standards by which new therapeutic agents can be properly evaluated. Its fourteen authors have been active in both research and teaching, in industry and medical schools. From their experience they discuss the signs leading from the inception of a drug to its application in clinic and hospital and offer criteria against which the practitioner can critically judge how thoroughly a new agent has been studied.

Advances In Enzymology (And Related Subjects of Biochemistry), *Edited by F. F. Nord, Fordham University (Vol. XXI), 521 pp., Interscience Publishers, Inc., New York, (1959), cloth,* **12.50.**

Contents of this latest volume include: Mitochondrial Metabolism, by Walter C. Schneider—Electron Transport and Oxidative Phosphorylation, by David E. Green—Mechanism of Metal Ion Activation of Enzymes, by Bo G. Malmstrom and Andreas Rosenberg—Durch Metallionen Katalysierte Vorgange, Vornehmlich in Bereich der Seltenen Erdmetall, by Eugene Bamann and Heinz Trapmann, Enzymic Reactions in the Synthesis of the Purines, by John M. Buchanan and Standish C. Hartman—The Enzymic Synthesis of Pyrimidines, by Peter Reichard—Biosynthesis and Function of Carotenois Pigments, by T. W. Goodwin—Folic Acid Coenzymes and One-Carbon Metabolism, by F. M. Hunnekens and M. J. Osborn.

Symbolic Logic And Intelligent Machines, *by Edmund C. Berkeley, Berkeley Enterprises, Inc., 203 pp., Reinhold Publishing Corp., New York, (1959), cloth,* **$6.50.**

The principles, methods and purposes of symbolic logic and Boolean algebra, on which the programming of intelligent machines is based, are explained in this work. The book develops from answers to basic questions those ideas and terms needed to understand the subject as a whole.

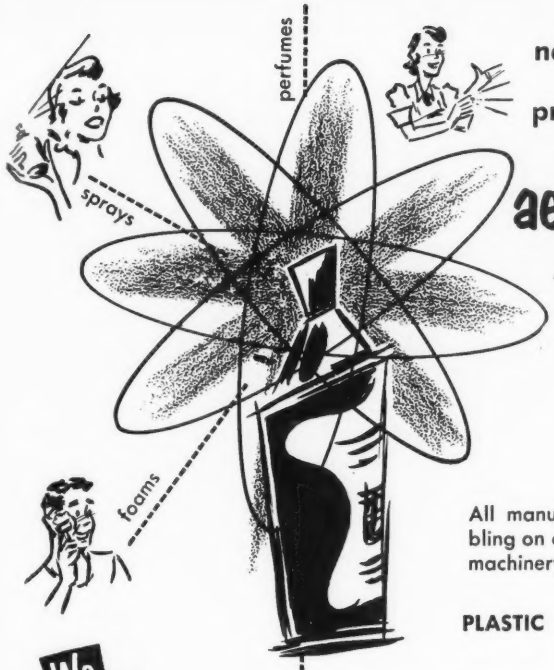
Steroids, *by Louis F. Fieser and Mary Fieser, 945 pages, Reinhold Publishing Corp., New York (1959), cloth,* **$18.00.**

This book, the impatiently awaited extension of "Natural Products Related to Phenanthrene" which appeared first in 1936, and then as new editions in the following year and in 1949, has now undergone complete recasting, so that the emphasis is solely on steroids. Let us report at once that "Steroids" is of the highest quality, that it can be improved only when the authors bring out the next edition. For the chemist who wants to know a little, the information is available and understandable; the chemist who wants to study the field will find all the material necessary; the steroid expert will find not only all the literature he already knows, but he will inevitably find references that he overlooked as well as systematic discussions of reaction sequences and synthetic procedures that will save much time and labor.

Twenty-two chapters cover the field, in extent and in depth, and literature coverage extends to February and March of 1959. Nothing new has been omitted, if it is applicable. The first chapter is an Orienting Survey and is followed by chapters on Investigations of Cholesterol, Structures of Bile Acids and Cholesterol, Vitamin D. Further chapters cover Physical Methods of Characterization, Oxidation, Enes and Ols, Ketones, Displacements and Rearrangements, Stereo-chemical Correlations and Conventions. Specific chapters are devoted in detail to Sterols, Methylsterols, Biosynthesis of Cholesterol, Bile Acids and Alcohols, Estrogens, Androgens, Progestogens, Homo and Nor Steroids, Adrenocortical Hormones, Cardiac-Active Principles, Sapogenins, and Alkaloids. Again the fountainhead of steroid information is Fieder and Fieser and no one even slightly interested in the field can get along without "Steroids."

Narcotics Lingo and Lore, *by J. E. Schmidt, M. D., Chairman, National Association on Standard Medical Vocabulary, 199 pp., pocket size, Charles C. Thomas, Publisher, Springfield, Ill., (1959), cloth,* **$4.25.**

Contained in this book are 2,333 entries representing the solid core of narcotic slang.



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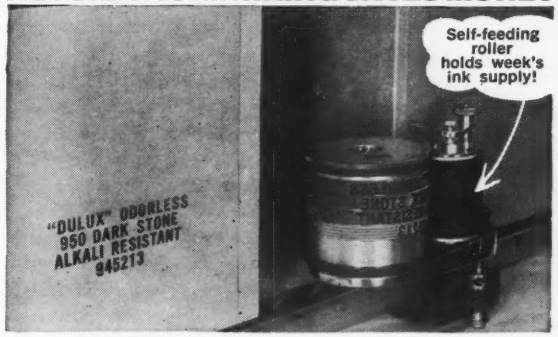

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Skin Research

Epidermal Lipids

Surface lipids consist of a mixture of sebaceous gland products and of lipids from the keratinizing epidermis. The horny layer imbibes this mixture. Early analyses of the epidermal lipids as such were limited to the plantar skin for the most part, in order to avoid contamination with sebum.

Epidermal specimens from 23 cadavers and 16 human volunteers with and without psoriasis were examined for lipid constituents by R. P. Reinertson and V. R. Wheatley (*J. Invest. Dermatol.* 32:49, 1959).

The epidermal lipids in the study are admixed with surface lipids in various proportions. The individual specimens from cadavers contained surface lipids in the original concentrations, modified by post-mortem washing. The surgical specimens studied here were washed thoroughly so that a certain proportion of the surface lipids was removed in each case. The pooled samples of "total epidermal lipids" and "stratum corneum lipids" contain somewhat less than the *in vivo* concentration of surface lipids, since the specimen in each case had been washed with water.

The present results agree in only a general way with previous data. The finding of approximately 80 per cent of cholesterol in a free state in both Malpighian layer and total epidermis agrees with Kooyman's observations for plantar epidermis, but is in disagreement with the figure of 40 per cent given by Glasenapp and Leonhardi for epidermis from the trunk. It is of considerable interest that a much larger proportion of "Malpighian layer lipid" than of "stratum corneum lipid" is non-saponifiable. This reflects, in part, the increased sterol synthesis of the epidermis compared with the sebaceous glands. Results are in agreement with the data of Nicolaides and Rothman, who found a much higher concentration of non-saponifiable lipids in total forearm epidermis than in corium lipid. The figure for squalene, calculated as 0.4 per cent dry epidermis, is in substantial agreement with that of 0.28 per cent given by Nicolaides and Rothman.

Analysis of the component fatty acids by gas chromatography showed that the fatty acids of the Malpighian layer differ markedly from the surface lipids and from dermoid cyst lipids. The odd numbered and branched acids, characteristic of the surface lipids, could not be detected. In contrast with the subcutaneous fat the Malpighian layer lipids contained more n-C_{10} acid.

In the course of sterol determinations by the Liebermann-Burchardt method, it became apparent that a significant proportion of epidermal sterols is not cholesterol, but other sterols. The ultra-violet absorption spectrum of this material was characteristic of 7-dehydrocholesterol. Since the work of Hou on the preen gland of the fowl, and of Helmer and Jensen on irradiated human skin surface lipids, it appeared likely that pro-vitamin D is excreted in the sebum, converted to vitamin D on the skin surface, and subsequently re-absorbed. However, difficulties were encountered in clearly demonstrating the presence of the pro-vitamin on the skin surface. Miller and Baumann recently demonstrated 7-dehydrocholesterol in total human skin. Recently, Wheatley and Reinertson found that the concentration of 7-dehydrochloesterol is much higher in total epidermis than in corium or subcutaneous fat. They postulated that in man, perhaps unlike lower animals, pro-vitamin D originates in the epidermis, rather than in sebaceous glands. However, 7-dehydrocholesterol was not then precisely localized within the epidermis. In the present study it is shown clearly that the concentration of 7-dehydrocholesterol is greater in the Malpighian layer than in any other cutaneous stratum and is apparently synthesized there, rather than in the sebaceous glands. There can be little doubt that the pro-vitamin activating wavelengths of the ultraviolet spectrum penetrate into the Malpighian layer of human skin.

In addition to 7-dehydrocholesterol, there are small amounts of other sterols in human epidermis. The nature and significance of these are unknown, through one component is likely to be lathosterol (Cholest-7-en-3βol) which has been isolated by Idler and Baumann from rat skin. The data presented are in accord with the view that in cholesterol synthesis the following sequence takes place: lanosterol — lathosterol — 7-dehydrocholesterol — cholesterol.

Our finding of a striking decrease in phospholipid concentration in the stratum corneum as compared with the Malpighian layer confirms the results of Kooyman on plantar epidermis, and is in accord with the finding of Snider, Gottschalk and Rothman that epidermal choline is both split from its phospholipid complex and decomposed during keratinization.

With regard to total lipid and sterol concentrations, comparable specimens from adult cadaver skin and surgically removed skin *in vivo* gave similar results. The total sterol and 7-dehydrocholesterol concentration was highest in the epidermis of a 2 week infant. This may reflect a smaller proportion of admixed sebum in the infant or a more active sterol synthesis shortly after birth.

In 5 of the 6 specimens from patients with psoriasis we found an

unusual lipid travelling together with 7-dehydrocholesterol on the alumina column. This material has a broad ultra-violet absorption in the range 260-290 mμ with sharp peaks at 270 and 281 mμ and this interferes with the determination of 7-dehydrocholesterol. It does not seem to give a "fast-acting" Liebermann-Burchardt reaction. This material was not found in any of the normal control specimens. Its nature and significance have not been determined. Small amounts of this material were present in psoriatic scales and in carbon tetrachloride wipings from the uninvolved back of a patient with psoriasis.

Skin Food

The preceding abstract contains the seeds of a couple of interesting ideas. First, if there is a view "that in cholesterol synthesis the following sequence takes place: lanosterol — lathosterol — 7-dehydrocholesterol — cholesterol," then this could be presumed to be a mechanism whereby lanolin itself might be considered to be a "skin food," since it contains about 10 per cent of lanosterol in its unsaponifiable portion. In the same sequence, 7-dehydrocholesterol is considered to participate in the synthesis of cholesterol, as well as being converted into vitamin D by the action of light. This sterol might be a useful addition to treatment of cosmetics. Better test this on complexions, however, to see if it does anything. Shall we call this the "American" method of testing, in contrast to the other methods that involve only assertion, with a minimum of proof. J.K.

Antifungal Immunization

Investigations were undertaken by E. L. Keeney and M. Huppert (*J. Invest. Dermatol* 32:7, 1959) with the purpose of determining whether or not it would be possible to produce a state of relative resistance to infection by a fungus of the dermatophyte group by treating topically with a non-viable preparation of this fungus to avoid an active infection. The results of these experiments indicate that the method of preparation of the immunizing material was successful in extracting antigenic substances and that treatment with this material was capable of inducing an increased resistance to infection by the homologous fungus.

Of the animals in the control group, 95 per cent developed rather severe lesions when exposed to infection, whereas only 14 per cent of the treated animals developed lesions of comparable severity. Such results indicate that it is possible to induce a state of increased resistance to this type of superficial fungous infection by the local application of antigens extracted from the fungus, and, furthermore, this relative immunity is still present in only slightly less degree one month after immunization.

A mixture of intracellular and extracellular antigens from broth cultures of one virulent strain of *Trichophyton mentagrophytes* was prepared. The preparation of antigenic material, carried out in the cold, involved homogenizing the fungous growth in its broth, drying the resultant suspension, and grinding the powder in a ball mill until the viability of the fungus had been destroyed. The final dry powder was made into an ointment. The ointment base alone and an antigen prepared from a species of *Alternaria* and incorporated in ointment base were used as controllable materials.

Male volunteers were treated with the three ointment preparations for a period of four weeks, and then challenged to a possible infection by *T. mentagrophytes*. Statistical analysis of the results indicated that acquired resistance developed in those subjects treated with *T. mentagrophytes* antigen.

Phenothiazine Sensitization

Studies of the skin reactions of a patient to various phenothiazine derivatives by D. Goodman and M. M. Cahn (*J. Invest. Dermatol.* 33:27, 1959) indicate that compounds containing a chlorine atom in the 2-position of the phenothiazine nucleus elicit positive skin reactions, while those without this substituent did not cause a reaction in the patient. The chemistry of the side chain, the feature which differentiates most of the phenothiazine tranquilizers, did not modify the skin reaction. No reactions developed to compounds without the chlorine atom—those with hydrogen, acetyl or trifluoromethyl in the 2-position. The patient, a laboratory worker, was first sensitized after working with a new compound, piperidylchlorophenothiazine, and suffered a severe eczematous rash on her hands. After the rash had disappeared, exposure to the same drug almost a year later led to reappearance of the eruption. Patch tests showed sensitivity to piperidylchlorophenothiazine, chlorpromazine, prochlorperazine, perphenazine, thiopropazate, and chlorpromethazine, all having a chlorine atom in the 2 position of the phenothiazine nucleus. Mepazine, triflupromazine, acetylpromazine, promazine, and promethazine, all without the chlorine substituent, did not cause a reaction. Repeated application to the skin of promethazine, however, created a new sensitivity to that compound.

Comment: The sensitzation reaction is a rare and wonderful thing when it permits the organism to distinguish between compounds as closely related as these are; the chemical laboratory cannot always be this discriminating.

Sunburn Treatment

Fourteen patients with severe sunburn were seen by M. M. Cahn and E. J. Levy (*A.M.A. Arch Dermatol.* 79:716, 1959) during July, 1958. Thirteen were adults, and one a child aged 11 years. Each adult received 16 mg. of triancinolone, as an initial dose, followed by 12 mg. in divided doses within the next 18 hours (4 meg. every 6 hours for three doses). Nine patients required no further treatment. The remaining four patients, who were the more severely sunburned, required an additional 12 mg. over the succeeding 18 hours. The child was given an initial dose of 12 mg., followed by an additional 12 mg. in divided doses over the next 18 hours for a total of 24 mg.

Improvement in each patient was rapid. No side-effects from the drug were noted in these 14 patients. Caution must always be exercised, however, when administering corticosteroid therapy, regardless of the amount prescribed or the length of time taken, because of the possible danger involved should some overwhelming intercurrent stress (such as the need for emergency surgery) arise.

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(*Continued from page 167*)

179 paralytic Type 1 cases in approximately 300,000 non-vaccinated children of the same age group as the vaccinees.

One significant finding was that none of the six cases of paralytic poliomyelitis among vaccinees occurred within the period of 10 to 20 days after vaccination. This is the period when any interference effect of the Type 2 virus would be expected to be maximal. Type 1 virus appeared to exert very little interference on the Type 2 virus.

The Sabin vaccine used, approximately 25 liters of Type 2, was prepared at the Merck Sharp & Dohme Research Laboratories, West Point, Pennsylvania, under the direction and supervision of Dr. A. B. Sabin. The selected virus strain was grown in rhesus monkey kidney cells and a special medium. The vaccine was then purified by centrifuging and filtration and stored at −20° C. Before use, it was tested for the absence of measles, for bacterial sterility, for the absence of a number of extraneous viruses, and finally for potency.

The Cox Vaccine

Lederle has so far produced 30 separate trial batches of the Cox vaccine, enough to immunize about 2,600,000 people against the three paralyzing polio virus strains. Each trial batch has come up to exacting standards of safety, purity, and potency. The first nationwide immunization program with oral polio vaccine is now under way in Costa Rica and the study is expected to provide confirming evidence of the safety and efficacy of the product. Covering all Costa Rican children under 11 years of age, the study should be completed in the fall.

The 13-year quest for an oral polio vaccine has been headed by Dr. Herald R. Cox, director of virus research for Lederle. The vaccine is the only one which has been shown in clinical studies to be capable of giving immunity to all three polio strains in a single oral dose.

Almost two million doses have been administered to approximately 700,000 people in the United States, Argentina, Brazil, Colombia, Costa, Rica, Cuba, Finland, Haiti, Israel, Japan, Mexico, Nicaragua, Peru, Puerto Rico, Spain, and Uruguay. Medical follow-up to these studies has reported not a single instance of adverse reaction directly attributable to the vaccine.

Children without previous protection against polio have responded to the vaccine with immunizing antibodies as follows: In a study in Minnesota, 90 per cent of children responded to Type 1 vaccine; 80 per cent responded to Type 2; and 86 per cent responded to Type 3. A Pearl River, New York, study has shown the following percentage responses to larger doses among adults without previous immunity: 96 per cent responded to Type 1 vaccine, 78 per cent responded to Type 2, and 100 per cent to Type 3.

Nicaraguan public health officials reported eight consecutive months without polio in that country following a large-scale trial with the Lederle vaccine. The Nicaraguan physicians characterized this as "unprecedented in the records" and regarded it as 'unlikely that this circumstance was not a consequence of the oral vaccination program."

As a result of research and clinical studies over the past nine years, the following conclusions have been reached by Lederle concerning its vaccine (trademarked Orimune).

It induces long-lasting immunity to all three types of polio viruses in a single dose when swallowed as a liquid. It is not injected.

It appears to provide protection against polio in much less time than was previously possible. After administration of the vaccine, neutralizing antibiodies are detectable in the bloodstream within 12 to 14 days, thus precluding the need of "booster" doses within a short period.

Its extreme ease of administration might reduce the cost of immunizing programs, resulting in a saving on cost per patient. For instance, public health officials in Colombia calculate that the overhead cost of recent mass immunizations with the vaccine in that country was between 40 and 50 cents per person. They estimated that a similar program carried out with an injectable vaccine would have tripled the cost per patient.

Lederle's Type 1 virus is a mixture of the Sickle and Mahoney strains and is known as the SM strain. The method of attenuation involved passage through 26 generations of mice, ten passages through monkey kidney tissue culture and then 14 passages through chick embryo tissue culture. Several final purification steps were required before the current nonvirulent strain was arrived at.

The Type 2 strain now used in the vaccine is the MEF-1, the only one fully adapted to grow in the chick embryo. Its attenuation was accomplished by passage through 157 generations of newborn hamsters. It was then adapted to grow in chick embryo, and given 17 passages through that medium. Final purification was achieved by passing the resulting virus through monkey kidney tissue culture 17 times and then plaquing it out three times.

Plaquing is a process whereby the virus is allowed to grow, and attack and kill monkey kidney cells on agar plates. Where the attack occurs, a hole is actually punched in the cell layer within a few days. The virologist then collects the virus colonies that made the smallest holes and injects them into monkeys to measure the virulence of each. The least virulent strain is then plaqued out again.

The third strain is the Fox strain, modified by 15 passages through monkey kidney tissue culture and four separate plaquings.

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search team. Just a few years ago it had been thought that such a vaccine was impossible, since the strains might interfere with each other. Dr. Sabin reported intereference (J.A.M.A., 164, 1957) among his strains and reported, "Immunization against all three types of poliovirus by a single administration of a mixture is not feasible."

For production batches, separated kidney cells from cynomolgus monkeys, mixed with a special nutrient, are seeded with the altered polio virus. After incubation and growth of the virus, tests establish potency, sterility, and freedom from unwanted viruses and the product is compounded and filled for use.

The vaccine has been shown to be stable at room temperature for five weeks, in its final commercial dosage form. It has been stored in this form under refrigeration for eight months so far with no loss of potency and it is probable that potency will be retained under these conditions for a longer period of time.

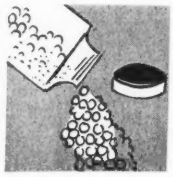
Details of a study with individual virus vaccines provided by Lederle are reported by Robert N. Barr, H. Bauer, H. Kleinman, E. A. Johnson, M. M. daSilva, A. C. Kimball, and M. K. Cooney of the Minnesota Department of Health and the University of Minnesota in *The Journal of the American Medical Association* of June 20, 1959. Attentuated strains of each of the three types of polio virus were given by mouth in a study of 550 volunteer subjects. No particular type of symptom or reaction marked the entrance of the virus into the body. The children, and to a lesser extent the adults, receiving the virus showed a generally increased titer of neutralizing antibodies. Attenuated viruses used in this study act like naturally occurring viruses in every respect, except that they do not produce the disease. Increase in neutralizing antibodies took place despite the fact that a substantial number of the participants had previously received Salk vaccine. The lack of responsiveness in adults may be a matter of dosage, or gastric acidity may be an important factor. True effectiveness of the attenuated poliovirus vaccine can be gauged only by its behavior in the face of an actual challenge by the disease itself. These strains have been used in a Type 1 outbreak in Colombia and in a Type 2 outbreak in Nicaragua, with good results. However, there were no control populations, and the administration of the vaccine in each case was given after the epidemic peak.

A communitywide vaccination program with attenuated poliovirus in Andes, Columbia, was discussed by H. Abad-Gomez, F. Piedrahita, R. Solorzano, and M. M. daSilva in *The Journal of the American Medical Association* of June 20, 1959. An outbreak of paralytic poliomyelitis occurred in southern Antioquia, Colombia, in January, 1958. A census located 2,922 families who agreed to participate in

(*Continued on page 250*)

Reader's Questions . . .

Buffered Aspirin: *Can you give me any information concerning the advantages of buffered aspirin over the unbuffered type, what buffers can be used and problems in the manufacture of this product?* OSLO.



In the first place, we have already participated in the controversy concerning the relative merits of buffered and unbuffered aspirin and have no great desire to reopen the subject. Nevertheless, aspirin is somewhat acidic and may cause subjective discomfort; the British medical literature has reported substantial irritation to the lining of the stomach from undissolved bits of the drug, but this is unlikely from tablets that are formulated for rapid disintegration. The admixture of sufficient buffer to aspirin itself presents two apparent advantages: the aspirin in the stomach is converted to a more soluble form which should be more readily available; stomach acidity will be reduced to relieve the discomfort which often underlies the headache to be relieved.

The nature of aspirin, acetylsalicylic acid, is at the root of all the difficulties in formulation and manufacture. The compound is very easily hydrolyzed, in the presence of traces of moisture and especially in the presence of alkaline substances, to acetic and salicylic acid. The latter is really strongly irritating while acetic acid has a penetrating odor that is noticeable even at low concentrations. Since the final preparation should have a shelf life of about a year, the breakdown of aspirin must not be accelerated. Practically all buffering agents that have some water solubility are unsuitable. Even those that are practically insoluble will often cause trouble on storage. All that can be really done to make the selection is to conduct accelerated and room temperature tests, analyzing at intervals for the presence of free salicylic acid. In making the test mixtures, and especially in large scale manufacture, atmospheric moisture as well as the moisture content of the product must be controlled with extreme care. Conditions are every bit as strict as in making effervescent salt mixtures.

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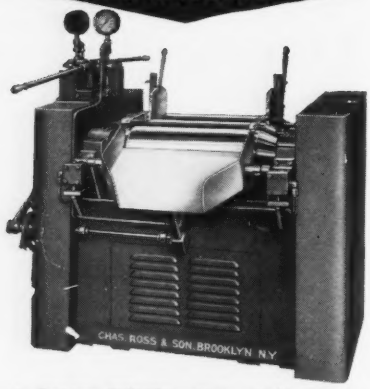


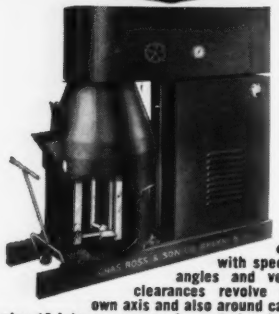
● Pressure indicating gauges provide greater ease in properly setting rolls, and less skill or experience is required by operator.

● Roll pressure settings can be recorded for exact reproduction of material assuring standardization of product.

● Special equalizers assure positive parallelism of roll faces at all times for uniform dispersions and minimum maintenance costs.

● Mills have quick roll release with safety overload feature, and are convertible for either fixed or floating center roll operation. 2½x5, 4½x10, 6x14, 9x24, 12x30, 14x32, and 16x40" sizes.

Production size dispersion type
Change Can Mixers with—
DOUBLE PLANETARY
stirrer action.



● Stirrers with special blade angles and very close clearances revolve on their own axis and also around can, developing 12 intense compressive and shearing actions with each revolution to break down and disperse agglomerates.

● Variable speed for infinite range of stirrer speed control. ● Simplified vertical hydraulic lift for greatest ease in cleaning down stirrers. ● Non-revolving can is completely enclosed during mixing for safety and to reduce solvent loss. Cans can be jacketed or fitted with slide gate when required. Cans are easily positioned or removed from Mixer. ● Extra heavy construction and standard type motor eliminate costly downtime. Oversized motor drives can be provided for kneading and mixing extremely heavy materials. 1, 2, 3, 4, 6, 8, 12, 25, 50, 65, 85, 125 and 150 gallon sizes.

Area of can contacted by stirrers during only one revolution of stirrers around can (2 seconds). Position of stirrers advances 4½° with each successive revolution to sweep entire area and all points on sides of can. Stirrers overlap each other as well as center of can.

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(*Continued from page 248*)

a program of vaccination: 7,378 children were vaccinated with Type 1 virus, 7,122 with Types 1 and 2, and 6,977 with all three. Children were fed a capsule of Type 1 attenuated virus; four weeks later they received Type 2 virus, and three weeks thereafter they received Type 3 virus. Vaccinated children who lacked demonstrable antibodies at the time of vaccination responded to the extent of 91 per cent to Type 1 virus, 72 per cent of Type 2 and 87 per cent to Type 3. Smaller, but significant, responses were shown by those with prior demonstrable antibodies. Although four new cases of poliomyelitis were reported in the Andes study area after the start of the oral vaccination program, none occurred in a vaccinated child or a contact, nor in areas where vaccination had begun. There have been no undesirable reactions associated with or attributable to the oral vaccination. Both the safety and immunizing efficacy of the three strains of virus employed were convincingly demonstrated. The authors stated, ". . . it cannot be proved that in the absence of the vaccination program an epidemic would have developed, and no claim is made to have aborted such an epidemic."

The whole oral polio vaccination picture seems highly optimistic. Convenience, safety, efficacy, and lower cost are strongly indicated, and the pharmaceutical industry as well as the general public can look forward with high confidence to the strongest kind of proof of these attributes in the near future.

FLAVORING PHARMACEUTICALS

(*Continued from page 169*)

such as bitterness, metallic aftertaste, sourness, saltiness, and antiseptic taste. At the same time, a list is made of the desirable characteristics to be achieved. Some of these are fruitiness, blended flavor, and lack of aftertaste. The intensity of each flavor and off-flavor characteristic is rated on a nine-point scale, ranging from "very faint" or "lack of" (zero) to "very strong" (eight). After complex testing by means of this established procedure, expert analysts are able to arrive at a flavor pattern. The pattern indicates how well the off-flavors are covered and why one flavor is considered a better covering agent than another. For example, a certain flavor may rate very low because of its inability to cover a metallic aftertaste.

The information which can be derived from sensory panel testing becomes a very useful guide, particularly for new product devlopment, and especially when a pharmaceutical house wishes to develop a product similar to that of a successful competitor. The sensory panel can save much time and effort by determining how the products differ and how far away the new one is from achieving a level of preference already established by consumer buying habits.

In short, while a sensory panel cannot generally replace extensive consumer surveys based on the over-all theory of what the public wants, it can successfully and less expensively indicate what the public is likely to accept.

ESSENTIAL OILS

(*Continued from page 171*)

nights, and particularly the dryness prevailing in the highlands. The plants are inclined to produce a great deal of woody stalk and insufficient leaf material, which results in a low yield of oil.

There are now three principal geranium growers in Kenya, all located near Lumbwa, Nyanza Province, in the White Highlands. The altitude here ranges from 6,800 to 7,500 feet, and the rainfall averages 45 inches per year. The most suitable soil for the geranium consists of well-drained volcanic tufa. Although deep, rich land gives the highest yield of foliage and oil per acre, the highest percentage of actual oil is obtained from plants grown in poor and shallow soil.

Prior to planting, the land is prepared by plowing and thorough harrowing, followed by ridging. Propagation is exclusively via cuttings, which are planted directly in the field. Their successful cultivation depends on favorable weather conditions. Cuttings are set out in the principal rainy season, spaced at intervals of two feet, in rows three feet apart. Frequent weeding is required while the plants are being established. A full harvest can be collected one year after planting; after that time the plants can be cut every six months.

To keep the fields in production for as long as possible, dying plants should be replaced with new cuttings. A plantation lasts about four years; then it becomes infested with weeds—particularly couch weed.

There are two harvests of geranium in the White Highlands, one lasting from June to July, the other from November to December. Cutting is done when the leaves begin to turn yellow, and the original lemon-like odor of the leaves changes to a rose scent. Plants are cut by hand, and must be harvested only on sunny days: on cloudy or rainy days, oil content is very low. Prior to distillation the cut plants are left to wilt in the fields for 24 hours, which facilitates packing the plant material into the stills, and makes for easier distillation.

The principal distillery near Lumbwa houses four stills, three of them made of concrete, each holding about 4,000 pounds of plant material. Distillation is by low-pressure steam—20 pounds per square inch in the boiler. Completion of one charge requires about 1½ hours of actual distillation, plus an hour for emptying, recharging, and getting steam up. One condenser serves two stills. By operating all four

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stills, 32 batches can be distilled in 24 hours.

Yield of oil averages ¾ pound per 1,000 pounds of plant material (0.075 per cent); but it may be as high as one pound (0.1 per cent). Yield of oil per acre now averages only ten pounds per year. This must be considered low, and arises from the facts that (a) in the White Highlands the geranium is usually very difficult to plant out, although very recently a novel method of solving this problem has been devloped, and (b) there are generally too few plants per acre. In past years certain areas, where a good stand of geranium had been established, have yielded as much as 22 pounds of oil per acre per year.

Total production of geranium oil in Kenya Colony once amounted to about three tons per year (from roughly 400 acres). More recently it has fallen to about one ton (from about 160 acres). The principal cause of this regrettable decline is the shortage of Kikuyu labor in Nyanza Province. Formerly, plenty of skilled agricultural labor could be had from this tribe; but, when the Mau Mau rebellion broke out, the Government had to remove most of the Kikuyus from Nyanza, leaving growers short of labor. However, conditions have begun to improve: workers (though less efficient than the Kikuyus) have been recruited from other tribes, and some of the Kikuyus are now being permitted to return.

Oil of Cedarwood

The so-called East African cedarwood oil is produced by steam distillation of the waste shavings and sawdust obtained in the making of pencil slats and cedar boards from the East African cedar, *Juniperus procera*, a tall and stately tree that grows in the highlands of Kenya Colony. One of the centers of the sawmill industry in Kenya is located near Elburgon, Rift Valley Province, at about 9,000 feet altitude.

Being a by-product, the cedarwood oil can be produced at low prices, and large quantities could be exported. In 1957, production of the oil amounted to about 60 long tons, most of which went to Great Britain. Production could be considerably increased, to perhaps 100 tons per year, on short notice, by the utilization of other stills now standing idle.

A typical still (made of steel or cedarwood) holds about 1 to 1½ tons of wet sawdust. Pressure in the steam boiler amounts to 40 to 60 pounds per square inch, in the still to about 10 pounds. Distillation of one charge may require 24 hours.

Fresh sawdust yields approximately 3 per cent of oil; sawdust exposed to the air for some time yields much less oil.

The oil is marketed in two forms, the crude oil—a dark brown, viscous liquid; and the rectified oil—a limpid, yellowish liquid.

As to the usage of the oil in the United States, there is not at the present time enough difference between the price of the Kenya oil and that of the

North American cedarwood oil (from *Juniperus virginiana*) to cover transportation costs and import duties on the former.

MERCK'S PUBLIC RELATIONS

(*Continued from page 173*)

cials, foundation presidents, clinical and research physicians, chairmen of boards of industrial firms, and medical and trade association officers. Several Nobel prize scientists were part of the survey panel.

The resultant report highlighted the need for expanded medical research. It documented in full detail exactly what was needed, and why. Once again, no Merck commercial was given. Horan said that 6,000 copies of the 63-page report were distributed by his public relations department to opinion leaders throughout the nation. "We believe," he added, "that our company spends more than most others on research ($17 million in 1958), so, it is no accident that we are so vitally interested in telling others how basic we believe it to be to this industry and to the welfare of our country."

A good example of how fast Merck's PR department can move was the way they handled the federal indictment of the companies which made the polio vaccine. Merck was the first company to issue a statement replying to the government. In fact, the wire services that carried the Department of Justice release on the indictment also had, at the same time, Connor's statement. In most instances, the newspapers that carried the news printed Merck's statement on the same page. This was a good example of how to get a corporate story told at the crucial time.

Product publicity occupies a small percentage of Horan's department's attention. This includes both news releases to science writers, for the public's information, and professional information to physicians. During this year and last, the public could have read about Merck's Diuril in *The Saturday Evening Post*, *The Reader's Digest*, and many other top magazines, as well as in most newspapers throughout the land. This coverage, a direct result of Horan's department, speaks well for Merck's success in getting information to the public. Even so, the consumer publicity was only launched long after all physicians were told about the drug. Moreover, the company policy is not to encourage premature release of information without the full knowledge on our part of what the drug can and cannot do."

Horan firmly believes that "the public has an inherent right to know about the activities of pharmaceutical firms. They have a deep interest in what we produce since there is so vital a function performed by our products. We recognize the public's right to know about what we do, and therefore we always try to give them all the facts."

There is a close relationship between Horan's de-

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partment and the advertising of the company, but professional and public relations are Horan's responsibility, not the ad department's.

Merck will soon announce an ambitious postgraduate program for the medical profession. Under the Merck Sharp & Dohme banner, it will provide physicians with comprehensive help in adding to their fund of medical knowledge. The company (on request) will send expert lecturers to medical groups and societies to talk on subjects of special interest to the physicians. In addition, Merck will support research conferences on subjects of interest to the medical world, and supply grants-in-aid to medical schools to enable practicing physicians to take additional postgraduate training. Television programs, films, and other audio-visual devices will be used to help get important medical information to the physician. And there will be no attempt to sell a single Merck product in any of this postgraduate program.

The tradition of Merck in pharmaceutical manufacture goes back to 1668 when a Merck ancestor became the proprietor of a pharmacy in Darmstadt. Nearly 300 years later, John Horan is actively engaged in seeing that this tradition continues to be full, rich and noble. His early training and experience in law have given him a careful and considerate demeanor beneath which lies a warmth and a thorough dedication to the enlightened task of informed public relations.

ARTIFICIAL SWEETENERS

(*Continued from page 177*)

of pigments in tablet coating solutions as discussed by Tucker.[29]

Compression coating of tablets has been another major advance in tableting. Technology has been rapid but many problems require resolution. Formulation studies on this tableting innovation have been carried out chiefly through industrial research. Since these findings are closely associated with competitive products, little has been published. However, some publications point to the use of sugar. Windheuser and Cooper[26] employed 15 per cent cane sugar and 73 per cent milk sugar in formulations used in their studies on compression coating. Wolff and Wilcox[27] used approximately 40 per cent cane sugar in their patent disclosures covering compression coating. One fabricator of compression coating machines has recommended as high as 90 per cent cane sugar.[28] Artificial sweeteners exhibit utility in compression coating formulas. Use of artificial sweeteners in approximately the same concentrations as recommended for film-coating produces a pleasantly sweet tasting tablet. More important than this is the fact that when sugar is eliminated from the formulation, other adjuvants and excipients can be used which are more compatible. This resolves some of the major

compression coating problems such as poor bonding with the tablet core and between layers, color uniformity, and instability in a humid atmosphere.

Another dosage form innovation in the pharmaceutical industry is that of sustained action medication. Cooper described a typical formulation in a recent publication.[30] A sweet taste may be desirable in some of these products. Sugar, however may adversely effect the disintegration time to such a degree that the sustained action preparation no longer releases the drug at the desired rate. The small amount of cyclamate required to impart proper sweetness to these preparations would not effect the disintegration or release rate significantly.

In the manufacture of gelatin capsules cyclamate and saccharin may be added to eliminate the bland and unattractive taste of these presently available containers for individual dosage.

In summary, cyclamate and saccharin have many applications in tablet formulations. The advantages of these agents over sugar are summerized below:

(1) in candy type medication of tablet form by decreasing size;

(2) in sublingual tablets by decreasing the possibility of dental caries and enhancing absorption of the drug by stimulating salivation;

(3) in effervescent tablets where the cyclamate and its acid can be used in combination with a carbonate as the effervescing agents;

(4) in film-type coatings to add a desirable sweetness to the coatings;

(5) in compression-type coatings to eliminate the use of sugar and therefore allow more volume for specific adjuvants necessary in these formulations;

(6) in antiobesity combinations to fulfill the desire for sweet taste;

(7) in sustained release preparations where sugar unfavorably alters the release rate of drug;

(8) in all tablets in general by eliminating the calories normally encountered when sugar is used and the prolonging effect sugar contributes to tablet disintegration; and

(9) in products used by diabetics.

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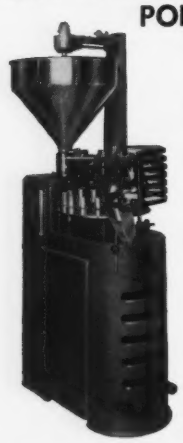

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X-RAY ANALYSIS

(*Continued from page 179*)

tion process. This procedure is stereo-specific and gives single optical form. Later, the company worked out a method for producing the material by chemical process. However, one of the steps in the synthetic process involved a resolution of the optical isomers into dextro-rotatory (antibiotic) and levo-rotatory (non-antibiotic) forms. Of course, optical activity was one available method for demonstrating the complete removal of the biologically inactive form. However, the degree of sensitivity of the optical determination was at best a 1 or 2 per cent indication of the presence of inactive material. By comparing the X-ray results for the antibiotic with its biologically inactive isomer, it was possible to show that the amount of inactive isomer in the product of synthesis was less than one-tenth of 1 per cent. Thus, through X rays the sensitivity of the tests was increased by a factor of 10 or 20, and it was possible to show identical purity of the material from fermentation and from synthesis.

It may be well to point out one feature of drug assays in which the problem is to determine an active component in a formulation. If it is possible to show the proper amount of one chemical group, fraction or moiety of the active material, this can often be used as assay for that component. For example, sodium benzoate can be assayed by determining the amount of sodium in the mixture, providing there is no sodium in the other components for formulating compounding material. Bromine in the cough syrup is part of the molecule of one of the drugs to be assayed. In hydrogenation and high-pressure catalysts, bromine is not part of the hyoscine molecule but was introduced as a hydrobromide salt of the alkaloid. However, the relationship between the amine of the alkaloid and its salt (hydrogen bromide) is exact; this allows the bromine percentage to serve as an indirect assay for hyoscine.

Parke-Davis scientists point out that for the identification of antibiotics and classification as to whether they are new or already known, often a great deal of labor can be saved by examining even a very small amount by X-ray analysis. Where a microorganism produces only a small amount of material, the X-ray method allows isolation and identification work to be done at bench rather than on pilot plant scale. •

(*Continued from page 185*)

for the screw cap. When asked, "In regularly replacing the cap, do you feel that it goes on securely each time?" affirmative answers were given by 60 per cent for the A type, 97 per cent for the B type, and 81 per cent for the screw cap.

As a safety measure, the difficulty that mothers encountered in replacing the A cap and the screw cap (that is, resealing the bottle) is more significant than their difficulty in opening them, since a loose cap can mean an open container.

The children's difficulty in removing the B cap and their mothers' ease in removing and replacing the B cap made it the closure of choice from the manufacturers' and the families' standpoint. This is clear from the figure.

Although questionnaire responses are often disapproved of for definitive satistical data, and however impressive these figures are, one must always keep in mind that over 6 per cent of the children under five years of age in the survey were able to remove, in one way or another, the B safety cap without great difficulty—many by using their teeth. At any rate, it must be realized that, regardless of what safety measures and precautions are taken, some children circumvent them in any case.

Summary and Conclusions

A survey of 1,600 families has indicated that a safety closure of plastic is not only practical for manufacturers and mothers but also, if used on all packaged and prescribed medicaments, is a child-safety measure of real importance. The widespread adoption of a safety closure of some type for all drug containers in common home use could reduce in great part the morbidity and mortality from the accidental, experimental, and innocent ingestion of potentially poisonous drugs. Hospitals should lead the way in dispensing drugs only in bottles with a safety closure.

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YOUR MARKET IN 1959

(*Continued from page 183*)

food store share of business ranges from 69.3 per cent in the case of dentifrices, to a low of only 25 per cent for laxatives. Note also that these 20 product groups of health and beauty aids have been arranged in two columns, those having the highest consumer food store preference on the left, and those having the least on the right.

Chart 2 shows that *total* sales of these 20 product groups through drug and food stores combined have

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far exceeded the combined sales gains of *all* products sold through these outlets. Some marketing experts have felt that this more favorable trend can be traced largely to the increased display and greater shopping convenience attending the placement of this merchandise in food stores, or from the greatly increased food store distribution of these products. If this premise is true, it seems to me that we should see generally greater sales gains for those product groups having *high* consumer food store preference, that is, those on the left-hand side of the chart, than for the products on the right-hand side of the chart, where food store preference is not so pronounced.

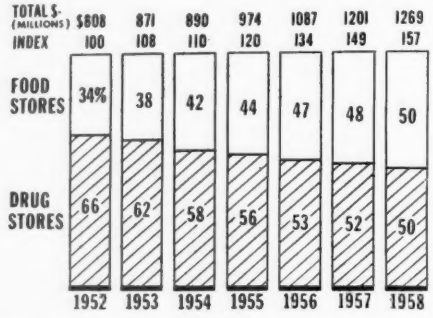

Chart 3
DIVISION OF PURCHASES OF HEALTH AND BEAUTY AIDS BETWEEN FOOD AND DRUG STORES: TOTAL SALES OF 20 PRODUCT GROUPS

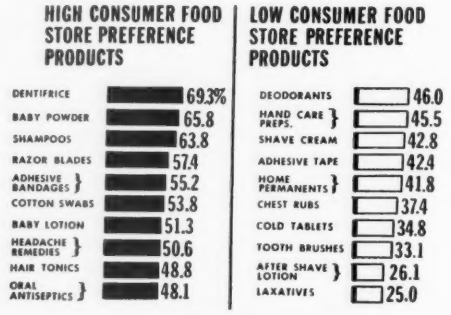

Chart 4
CUSTOMERS' PURCHASE OF HEALTH AND BEAUTY AIDS FOOD STORE SHARE OF FOOD-DRUG TOTAL IN 1958

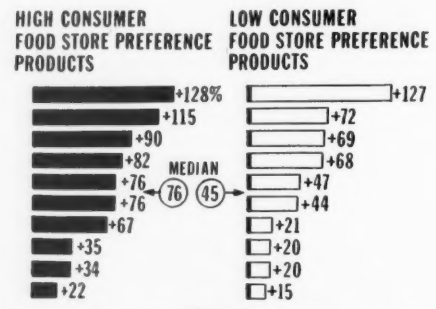

Chart 5
SIX-YEAR CONSUMER SALES TREND THROUGH FOOD AND DRUG STORES COMBINED: 1958 VS. 1952

Chart 5 indicates this sales trend more closely. It is set up so that the six-year sales increase *through both types of outlets combined* for each of the ten product groups having *high* consumer food store

preference ranges in descending order from a high of 128 per cent to a low of 22 per cent. These are not necessarily in the same order as in the preceding chart; they have been arranged in this fashion so that we could readily determine the mid-point or median gain for this group of ten products—plus 76 per cent.

Turning to the ten product groups having lower consumer food store preference, we note that the six-year sales gain ranges from a high of 127 per cent—almost the same as in the case of the leading product group among the high consumer food store preference products—to a low of 15 per cent. The median sales change is only plus 45 per cent.

In other words, where the food store has not entered the picture very strongly, the 45 per cent gain for the average product over the six-year period is *almost identical* to the 41 per cent to 42 per cent gain for *all* products sold through food and drug stores. On the other hand, where the food store *has* entered the picture rather heavily, the 76 per cent sales gain is *substantially greater* than the average for all products.

If I were a drug store operator, however, I would want to know what had happened to the *drug store* sales on these 20 product groups. In other words, as a drug store operator I would like to know whether *my* sales gains were materially different for those products with high food store exposure in comparison with those products where the food store had not entered the picture very strongly. Chart 6 answers this question by showing the six-year consumer sales trend through drug stores only.

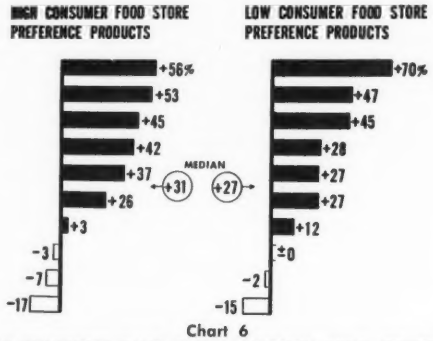

Chart 6
SIX-YEAR CONSUMER SALES TREND THROUGH DRUG STORES ONLY: 1958 VS. 1952

Here we have contrasted the six-year sales change for the ten product groups with high food store preference with that of the low consumer food store preference products, this time in drug stores only.

Analyzing the high consumer food store preference products shown on the left, we note that the six-year sales change ranges from a high of 56 per cent to a low of −17 per cent, with the median gain of +31 per cent. On the other side of the picture we note that those product groups having low consumer food store preference had sales changes *through drug stores only* ranging from +70 per cent to a low of −15 per cent, with an over-all median value of +27

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per cent. Generally speaking, I think you will agree that there is little difference in the six-year drug store sales trend between these two groups of products. If anything, the drug store sales trend is even a little better for those products on the left-hand side of the chart, i.e. those with high food store consumer preference.

So much, then, for the general drug and food store business and for the trends of twenty health and personal care items. We next turn to Chart 7, which covers a group of products more closely identified with the drug and cosmetic business.

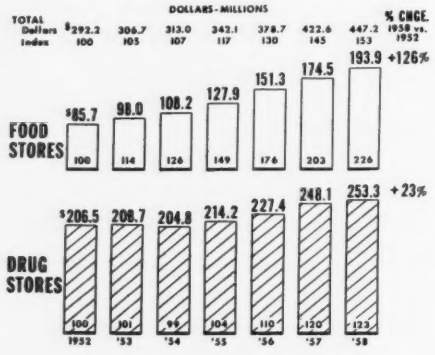

Chart 7
PROPRIETARY BUSINESS WITH RETAIL CUSTOMERS:
5 REMEDIAL PRODUCT GROUPS

This chart covers the six-year sales trend for five remedial product groups—headache remedies, laxatives, cold tablets, chest rubs, and stomach remedies. In the first place, you will note that the total sales of these five remedial product groups through food and drug stores combined have increased 53 per cent over the six-year period—almost identical to the sales gains shown for the entire list of 20 health and personal care items. Sales in food stores are up 12 per cent—almost the same as the 130 per cent gain shown for all 20 health and personal care product groups, while drug store sales are up 23 per cent, again about the same as we had previously seen for all 20 classifications.

Food store sales increases for these products, although substantial, have not prevented drug stores from gaining. As a matter of fact, the similarity of trends between this group of five remedial products and the entire group of 20 health and personal care classification suggests that our previous conclusions regarding the effect of food store sales on drug store business apply here as well.

One of the major factors back of the substantial food store increase over the six-year period is increased distribution, as shown on Chart 8.

On the left-hand side of this chart we have repeated the over-all trend of food store sales for the five remedial product groups from 1952 to 1958, starting at an index of 100 and continuing to an index of 226—a gain of 126 per cent as we have seen on the preceding chart.

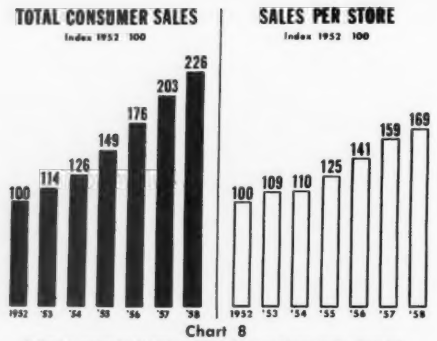

Chart 8
TOTAL CONSUMER SALES VS. SALES PER STORE:
5 REMEDIAL PRODUCT GROUPS IN FOOD STORES

On the right-hand side, is balanced out the effect of increased distribution by placing these sales on a per-store basis. Using 1952 as an index of 100, we observe that sales in 1958 were at an index of 169—equivalent to a gain of 69 per cent over the six-year period.

It would thus appear that almost half of the 126 per cent sales gain of these five remedial product groups in food stores traces to increased distribution—a factor which is rapidly removing itself from the picture as more and more brands are stocked by more and more food outlets. As time goes on, therefore, I believe we can expect to see a food store sales trend for these five remedial product groups more in line with the right-hand side of the chart rather than the left-hand side.

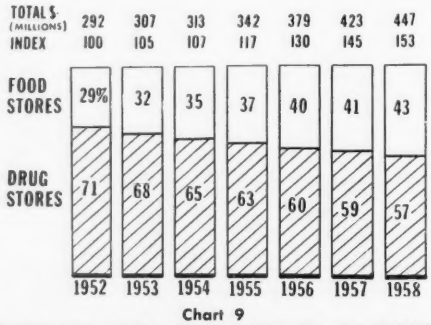

Chart 9
HOW CONSUMERS DIVIDE THEIR PURCHASES OF PROPRIETARIES BETWEEN FOOD AND DRUG STORES: 5 REMEDIAL PRODUCT GROUPS

The relative importance of food stores to the food-drug total is best shown in Chart 9. It will be recalled that the drug-food split for all 20 health and personal care product groups was 50-50 in 1958. While drug stores still account for 57 per cent of remedial products volume as compared with 43 per cent for food stores, it will be noted that the food stores are gaining in importance, increasing from 29 per cent of the market in 1952 to 43 per cent currently.

In weighing the relative importance of each type of outlet in the sales of these remedial products, however, consideration must be given to *sales per store*, as well as to total sales. This is clearly shown in Chart 10.

As nearly as can be determined prior to completion of the next Retail Census scheduled for the end of

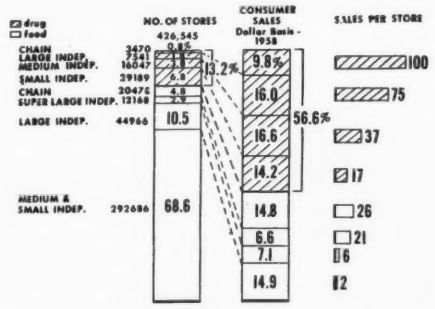

Chart 10

IMPORTANCE OF SIZE AND TYPE OF RETAIL DRUG AND FOOD STORE IN SALE OF PROPRIETARY PRODUCTS: 5 REMEDIAL PRODUCT GROUPS

this year, there are approximately 427,000 chain and independent drug and food stores serving as potential outlets for your products. This will be cut back somewhat for certain types of products where current state laws prohibit their sale in non-drug outlets, but the pattern shown here generally applies.

As we have already indicated, the chain and independent drug stores account for almost 57 per cent of total sales for these five remedial product groups—56.6 per cent to be exact. Note, however, that this substantial volume of business is handled by approximately 57,000 retail drug and proprietary stores—only 13.2 per cent of the total number of retail outlets. A major reason, therefore, why the food stores do such a tremendous amount of business in this field, as well as in the sale of all health and personal care items generally, is the fact that there are so many more stores—some 370,000 as compared with 57,000 drug outlets.

This situation is clearly illustrated in the right-hand section of the chart where we have calculated the sales per store for these five remedial product groups. The chain drug store is substantially ahead on this basis and has hence been put at an index of 100. The chart may be interpreted in this fashion: For every $100 of remedial product sales per chain drug store, the large independent (over $150,000 annual volume) sells $75; the medium independent drug store (annual sales $75,000-$150,000) sells $37; the small independent drug store (sales less than $75,000 per year) sells $17; the chain food store sells $26; the super large independent food store (annual volume over $300,000) sells $21; the large independent food store (annual sales $100,000 to $300,000) sells $6; and the medium and small independent food store sells $2.

The chain drug store, therefore, as an individual unit, is almost four times as important as a single chain food store, and almost five times as important as a super large food independent. The large independent drug store is almost three times as important as an individual chain food store and approximately three and a half times as important as an individual super large independent food store.

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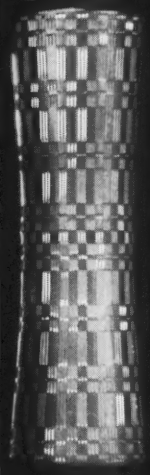

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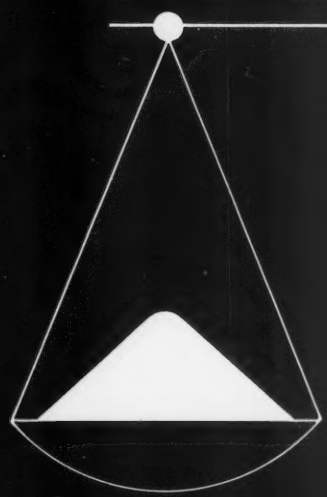

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store in the sale of proprietary products is shown on Chart 11. This chart shows a two-year comparison of competitive position for 48 nationally advertised proprietaries in food and drug stores combined, covering what is essentially the early part of calendar year 1959 versus the corresponding period in 1957, the two-year comparison being made to avoid the differences caused by the unusual conditions attending the influenza epidemic in the fall of 1957. The current comparison contrasts a period *prior* to the flu epidemic with one approximately a year after the major effects had made themselves felt.

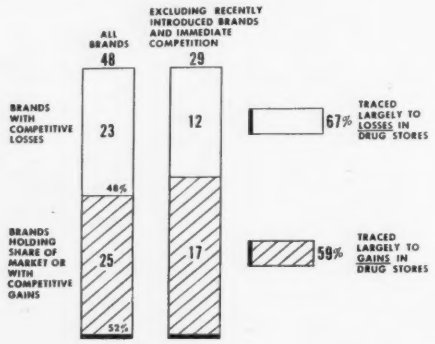

Chart 11
BOX SCORE OF COMPETITIVE GAINS AND LOSSES—1958 VS. 1957

Of the 48 nationally advertised proprietary brands studied, 25, or 52 per cent, either held their share of market or secured competitive gains, the balance of 23 brands showing competitive losses over this period.

The second bar on the chart illustrates the situation *excluding* recently introduced brands and the competing brands immediately affected. In other words, the second section of the chart shows what happened to 29 nationally advertised proprietary brands not affected one way or another by recently introduced products. Note that 12 of these brands had competitive losses while the remaining 17 brands either held share of market or gained competitively.

That the drug store was an important part of this picture is evidenced by the fact that 67 per cent of these *losses* traced largely to *losses in drug stores*, while 59 per cent of the 17 brands *holding or gaining* share of market did so largely through the *gains in drug outlets*.

I would like to conclude with an analysis originally made at an address before the NARD in the fall of 1957, covering the importance of the retail drug store from a traffic or a transaction standpoint. I have tried to bring this information up to date in Chart 12.

What this chart attempts to show is the estimated number of annual transactions in drug versus food stores. This is obtained by dividing the annual sales volume by the size of the average transaction in each store; size of transaction, of course, means the total amount a customer spends in a store on each visit.

In the case of food chains, supers, and large independent food stores, we know that the annual 1958 volume of business was $36,830,000,000. According to recent estimates put out by Super Market Institute, the average transaction in the newer super markets is $5.20. Making the indicated division, results in a total of 7,080,000,000 transactions per year for these giant food outlets.

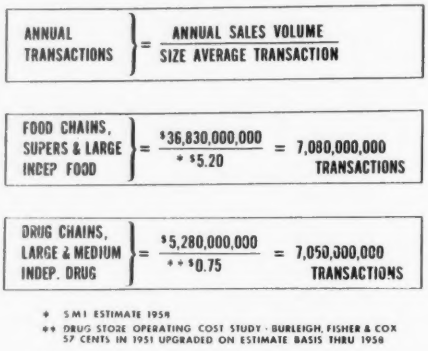
ANNUAL TRANSACTIONS = ANNUAL SALES VOLUME / SIZE AVERAGE TRANSACTION
FOOD CHAINS, SUPERS & LARGE INDEP FOOD = $36,830,000,000 / * $5.20 = 7,080,000,000 TRANSACTIONS
DRUG CHAINS, LARGE & MEDIUM INDEP. DRUG = $5,280,000,000 / ** $0.75 = 7,050,300,000 TRANSACTIONS
* SMI ESTIMATE 1958
** DRUG STORE OPERATING COST STUDY - BURLEIGH, FISHER & COX 57 CENTS IN 1951 UPGRADED ON ESTIMATE BASIS THRU 1958

Chart 12
THE DRUG STORE POTENTIAL

Turning now to drug stores, our most recent figures show that drug chains, large, and medium independent drug stores accounted for sales of $5,280,000,000 in 1958. Based on the study of drug store operating costs and profits prepared by a joint committee underwritten by manufacturers, the NWDA, and the NARD, published by Burleigh, Fisher & Cox, the average size transaction in 1951 was 57 cents. This has been upgraded through 1958 based on price changes and other information and is now believed to be in the vicinity of 75 cents. Dividing the annual volume of business done by drug chains, large, and medium independent drug stores by this average size transaction, results in a total figure of 7,050,000,000 transactions for 1958—substantially the same as the total number of transactions in food stores.

How does all of this affect your marketing plans for 1959 and for the years ahead? While circumstances alter cases, it seems to me that the following points deserve serious consideration:

(1) In view of the fact that Mrs. Consumer currently purchases 43 per cent of her proprietaries and 50 per cent of her health and beauty aids through food stores, wherever legally possible your products should be available for sale in all food stores having annual sales of $100,000 or more. Our special study on 20 health and personal care product groups shows that (a) consumer sales *through food and drug stores combined* have increased *more* for those product groups where food stores are an important factor (+76 per cent over six years) than they have where food stores are less important (+45 per cent); and (b) consumer sales *through drug stores alone* have increased *just as much* for those product groups where food stores are an important factor (+31 per cent over six years) as they have where food stores are less important (+27 per cent).

(2) For most proprietaries, brand distribution in corporate food chains and large size distribution in all large food outlets present the most difficult problems.

(3) In planning any special in-store promotion activity (cooperative advertising, special display, merchandising aids, tie-ins with national advertising, etc.), take sales per store into consideration. Our special study of five remedial product groups shows that (a) an individual chain drug store produces *four times* as much business as an individual chain food store and almost *five times* as much as a super large independent food store; and (b) an individual large independent drug store (over $150,000 annual volume) produces almost *three times* as much business as an individual chain food store and almost *three and one-half times* as much as a super large independent food store.

(4) Weld the drug store firmly into your brand marketing plans on a year-in and year-out basis. Our special study of five remedial product groups shows that (a) excluding new brands and immediate competition, 67 per cent of the brands *losing* competitively over a two-year period in food and drug outlets combined traced their losses entirely to drug stores; similarly, 59 per cent of the brands *gaining* competitively traced their gains almost entirely to drug stores and in another 29 per cent the drug store was an important contributor to improved position along with food outlets; and (b) drug stores in the $75,000 and over group have about as many potential customers in terms of transactions per year as all chain and independent food super markets combined—a little over seven billion each.

(5) Intensify your efforts to introduce new products with demonstrable appeal and value to the consumer. One-third of the brands having competitive gains over the past two years were in this category, and approximately one-half of the brands losing competitively did so because of new brand competition.

(6) Continue your search for more effective copy.

(7) Maintain advertising pressure consistent with your share of sales—present and expected.

The proprietary industry has made tremendous progress in serving the public during the 25 years we have watched its growth through the Nielsen Index, and I confidently expect that this substantial progress will continue as we chart your market in 1959—and in the years to come!

MILES RESEARCH

(*Continued from page 180*)

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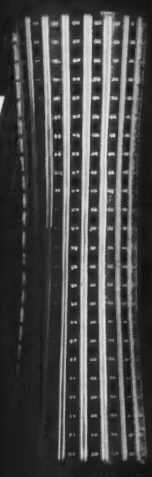

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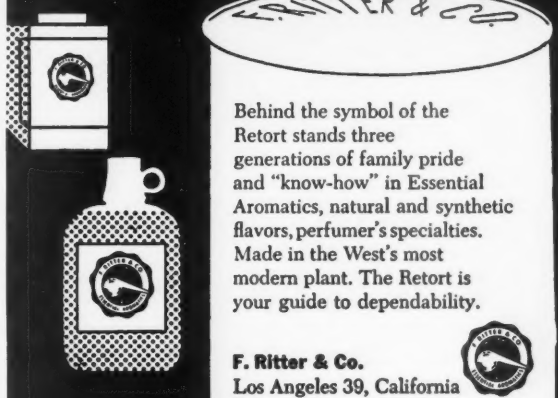

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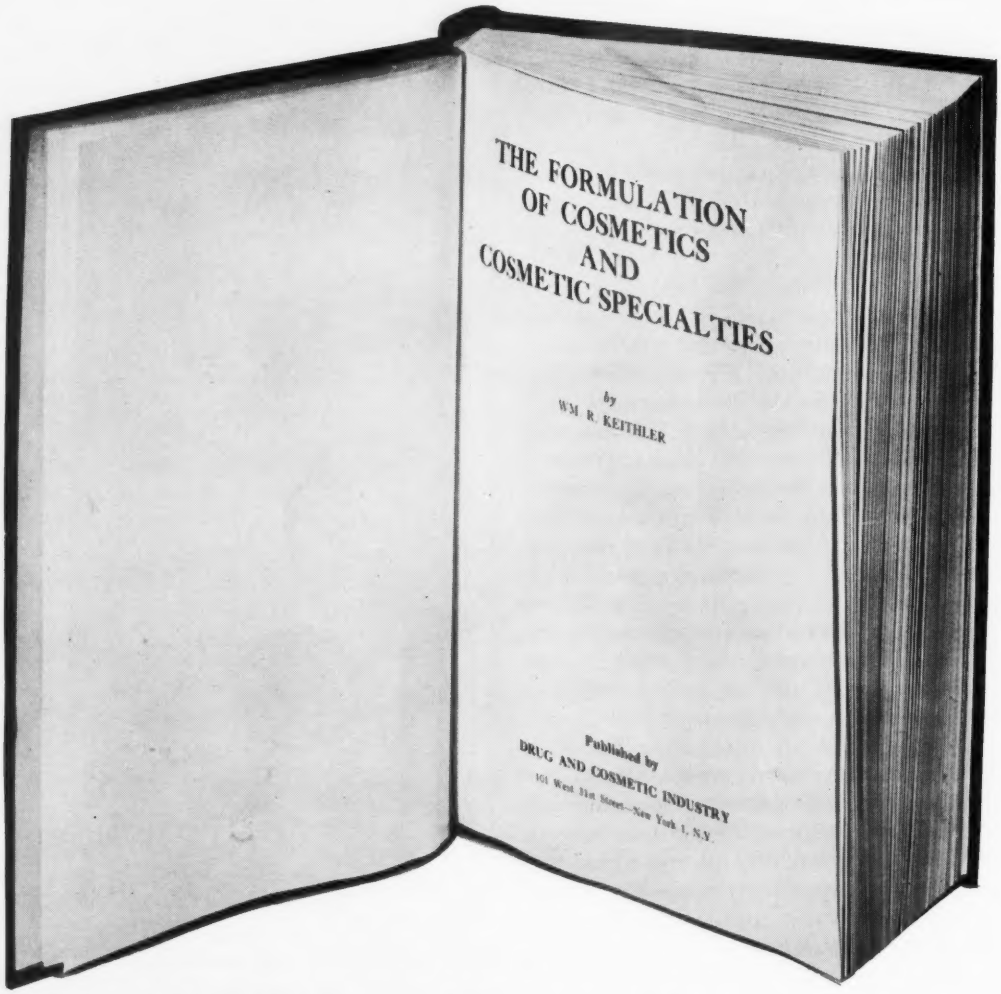

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(*Continued from page 175*)

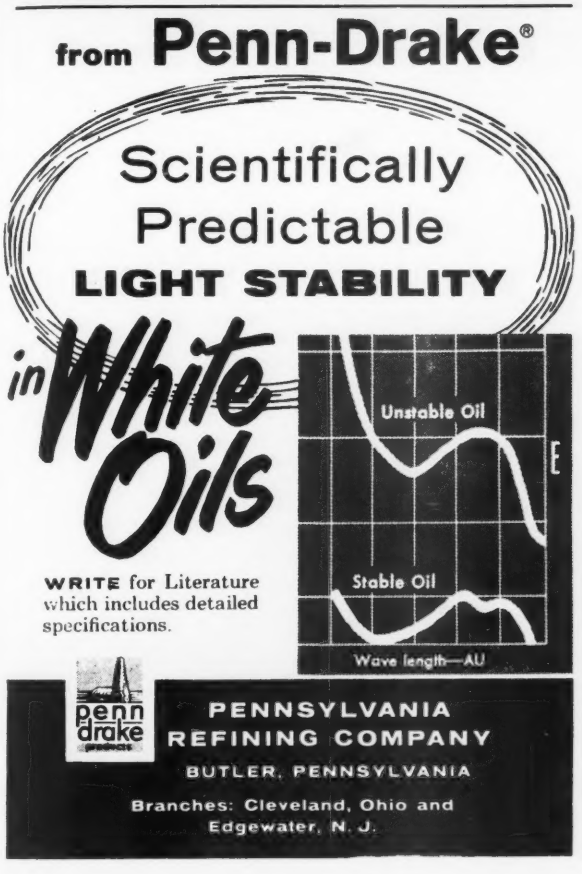
the skin. Although this property of remaining on the skin is valuable in cosmetic deodorants, compatibility with alkali is less important. Cationic detergents, which also adhere to the skin, are very effective bacteriostatic agents in properly formulated deodorants, but a non-irritating compound must be selected.

Antibiotics, including tyrothricin, neomycin, and chlortetracycline, are effective anti-bacterials and anti-infectives when applied to the skin, as might be expected. Their use in deodorants is not free from problems, however. Some may cause sensitization reactions; even more important, the development of resistant bacteria might be encouraged. A growing problem in the use of antibiotics in the treatment of serious general infections is that the development of microorganisms that are not affected by these antibiotics seems to be encouraged by indiscriminate use of the powerful germ-killers. This should not be the case, on the other hand, if antibiotics in deodorants are not the ones given by mouth or by injection to treat general infections.

Ion exchange resins have been suggested and tested for deodorant use and found to be effective; their cost is a drawback, however. They function, as a mixture of anionic and cationic resins, to pick up and hold tightly all of the acidic or basic odorous constituents of sweat by a combination of chemical action and adsorption. Deodorant creams and ointments probably also have some degree of effectiveness as absorbents, the compounds that might be attacked by bacteria being absorbed by fatty material and then kept odorless by the antibacterial.

Antiperspirant action, the reduction of the flow of perspiration, is ascribed to astringent substances, such as the various aluminum salts and other polyvalent metallic ions. Their mode of action is not entirely clear, but may be related to their power to swell and coagulate skin proteins and thus reduce the size of the opening through which perspiration is discharged. For the most part, these preparations may reduce the flow of perspiration, but do not stop it entirely. Complete mechanical stoppage will produce severe irritations. Elaborate laboratory methods have been devised to measure the degree of astringency; a simple test is the astringent effect on the mouth and tongue.

Most active astringent compounds have *p*H values in solution in the acid range. Where the acidity is substantial, and due to a mineral acid of low volatility, textiles in contact with the treated skin area will eventually be weakened and discolored. Buffered mixtures of intermediate acidity have overcome this disadvantage. Buffering is accomplished by mixing the aluminum sulfate or chloride with a compound that neutralizes the acidity produced by hydrolysis, by using soluble aluminum salts of weak acids, or by preparing self-buffered aluminum compounds, such as the aluminum chlorohydroxy complex.



These efforts seem to have been quite successful in reducing or eliminating textile attack while retaining astringency for antiperspirant action.

On an experimental level, antiperspirant action has been accomplished by pharmacological means, that is, the use of drugs that stop glands from excreting sweat. Sodium malonate, counteracting an enzyme activity that seems to accompany profuse sweating, has been reported as effectively reducing perspiration when applied to the skin. Results of further investigation have not been revealed; consequently the present status of this interesting approach is unknown. There have been a number of investigations showing that atropine-like drugs (which tend to reduce secretions generally) when injected or taken by mouth will reduce the flow of perspiration. There is also some reason to believe that drugs of this nature will work directly on the sweat glands when applied to the skin, and reduce sweating locally. Unfortunately, these compounds tend to be too active and poisonous, so they cannot yet be safely used in cosmetic preparations.

Astringent antiperspirants are very effective deodorants. They accomplish this action by being antibacterial, and also by reacting with odor-producing constituents of sweat. They combine with the precipitate proteins and their decomposition products, making the former resistant to bacteria and the latter non-volatile.

Formulas for various types of preparations have been given repeatedly so that at this point only a light run-through is necessary. Powders, whether for foot or body deodorant use, should be based upon colloidal kaolin for effective moisture absorption, with enough talc to make a smooth-flowing powder and to reduce the tendency to caking. Antibacterial and deodorant properties may be added by the use of one of the low-solubility phenolic derivatives and an aluminum compound will serve as an astringent. Methenamine has been suggested as a deodorizing astringent in foot powders. Acid perspiration causes partial breakdown with release of formaldehyde, a powerful antibacterial and protein precipitant. Unfortunately, a formaldehyde odor is sometimes apparent and the parent compound has some reputation as an irritant and sensitizer.

In liquids to be daubed or sprayed on the skin, the preparation may be a perfume deodorant, consisting of the antibacterial and the perfume dissolved in alcohol and then diluted with water to make a final alcohol concentration of 30 to 60 per cent. Concentrations of deodorant and perfume should be selected for complete solubility in the final concentration of dilute alcohol. Liquid antiperspirants contain from 10 to 20 per cent of an astringent salt and a few per cent of a high boiling liquid solvent, glycerin, propylene glycol, one of the polyglycols, sorbitol solution, etc. to leave a liquid film on the skin. Perfuming is not easy in the presence of this concentration of precipitating salt; the perfume must be stable at the reduced *p*H level of the solution. Aluminum phenolsulfonate is soluble in alcohol, for a preparation that dries more quickly on the skin.

Lotions suitable for use in roll-on bottles should be rather fluid so that the applying ball is readily wet by the product. The aluminum salt concentration should be from 15 to 20 per cent and the lotion emulsifier will consist of one or a mixture of glyceryl or polyoxyethylene fatty acid esters or fatty alcohol ethers. An acid-stable primary emulsifier such as a quaternary compound will improve stability. Creams are more of the same, with higher concentrations of the fatty emulsifier and often with higher astringent concentration. It is generally better, in making liquid or cream emulsions containing high concentrations of aluminum salts, to make the emulsion first and then allow it to cool down, adding the aluminum salt as a concentrated solution with mixing at the lowest convenient temperature.

Deodorant sticks are alcohol formed into a solid gel by means of sodium stearate. Water should be as low in concentration as possible; soap concentration is usually about 8 per cent. Because ordinary aluminum salts will react with the soap and destroy the gel, only the anionic sodium chlorhydroxy aluminum lactate may be used in these soap gels. Ordinarily they will contain up to 0.5 per cent of hexachlorophene and from 3 to 5 per cent of propylene glycol. An ingenious variation is a soap gel stick based upon the deodorant action of an antibacterial agent with a soap gel core containing the sodium aluminum chlorhydroxylactate; production is not easy.

RECENT PATENTS

(*Continued from page 199*)

2,889,341—G. D. Searle—Perhydrophenauthrene Carboxylates.

2,889,342—G. D. Searle—Pregnadien 20-Ones.

2,889,344-5—G. D. Searle—Hydroxypregna-3, 20-Diones.

2,889,355—Ciba—Hydrophenanthyrl Carboxylic Acids.

2,889,367—Polak & Schwarz—4-Acyl-Dimethyl T.-Butyl Indanes.

2,889,371—G. D. Searle—6-Phenanthrols.

2,890,116—U. S. A.—Estogenic Coumarone.

2,890,152—Schering—Anti-Inflammatory Compositions.

2,890,218—Hoffmann-La Roche—Sulfanilamidopyrimidine.

2,890,219—G. D. Searle—Alkylaminoaldanols.

2,890,223—Research Corp.—Benzyl Methyl Methoxytreyptamine.

2,890,227—Syntex—Methylene Testosterone.

2,890,244—Endopharm (Germany)—Tribromo Acetylaminobenzoic Acid.

2,890,246—U. S. A.—Dichlorovinyl Cysteine.

2,890,249—Hoffmann-La Roche—Trimethylcyclohexen-Ylidene-Methyl Buten Al.

2,890,979—Proco-Sol Chemical Co.—Procaine-2-Pyrrolidone-5-Carboxylate

2,890,980—American Cyanamid—Antistatic Medicated Animal Feedstuff

2,890,981—Charles Pfizer—Anthelmintic Compositions

2,890,983—P.L.V. Minot (France)—Excipient

2,890,984—Charles Pfizer—Pharmaceutical Composition Containing Tetrahydro Naphthyl Imidazoline

2,890,985 — D. F. Marsh et al. — Spasticity-Relieving Compound

2,890,987—Witco Chemical Co.—Stick-Form Astringent

2,891,051—Charles Pfizer—Adducts of Salts of Novobiocin

2,891,063—Abbott Labs.—Pipe azines

2,891,066—Parke, Davis—Phenyl 1-Alkanol Piperidines

2,891,068—Takeda Pharm. Ind. (Japan)—Quat. Ammonium Acyl Derivatives of Vitamin A Aldehyde Hydrazones

2,891,069—J. R. Thornton et al.—Halophenyl Hydantoins

2,891,071—Upjohn—Lower Alkyl Quat. Ammonium Salts of Trimethyl Diphenyl Pyrsolidenebutyramide

2,891,076 — Olin Mathieson — Dimethyl Pregnatriene Dione

2,891,078—G. D. Searle—Dialkyl Hydroxy Nor Androsten Ones

2,891,079—G. D. Searle—Methyl Pregnadiene Dione

2,891,080—Charles Pfizer—Hydroxy Halo Hydrocortisone

2,891,081—Takeda (Japan)—Vitamin A. Aldehyde Derivatives

2,891,087—Charles Pfizer—Bixin

2,891,838—Ben Venue Labs.—Non-Inflammable Ethylene Oxide Sterilant

2,891,890—Burroughs Wellcome—Method of Treating Parkinsonism

2,891,891—A. B. Ferrosan (Sweden)—Mixture for Preparing Large Intestine for X-Ray Photography

2,891,912—Gillette—Opalescent Detergent

2,891,943—Chemie Grunenthal (Germany)—Antibiotic Pantothenates

2,891,948—G. D. Searle—Epoxypregnenes

2,891,949—American Cyanamid—Sulfapyrimidines

2,891,953—American Cyanamid—Pyridazines

2,891,957—Wm. S. Merrell—Amino Alkoxy Phenyl Methanes

2,891,963—Lab. OM (Switzerland)—Oxazolidones

2,891,973—Labs. Francais Chim. (France)—Steroid

2,891,974—Julian Labs.—Androstadienes and Pregnadienes

2,891,987—Merck—Aminoxypropionic Acids

2,891,988 — American Cyanamid — Formyl Oxovaleric Acid

2,892,753—C. H. Bochringer (Germany) Central Nervous System Stimulant

2,892,833—G. D. Searle—Epoxypregnane Diols

2,892,850—Olin Mathieson—Chloro Steroids

2,892,851—G. D. Searle—Fluoro Acyloxyprogesterones

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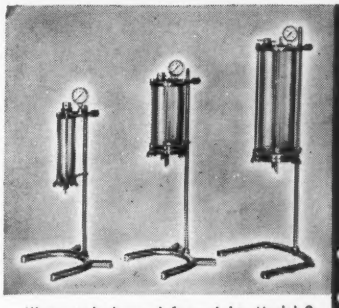

Illustrated above, left to right: Model 9; Model 10; Model 21 and 21-1.

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21	2800	96	5½"	21
10	1300	45	4¼"	9.62
9	260	9	2¼"	3.34

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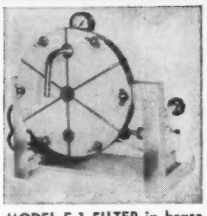

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COMING EVENTS . . . . .

AUGUST

16-23 **American Pharmaceutical Assn.,** annual meeting, Netherlands-Hilton Hotel, Cincinnati, Ohio (Dr. Robert P. Fischelis, 2215 Constitution Ave., N.W., Washington 7, D.C.)

17-21 **Gordon Research Conference** (Food and Nutrition), Colby Junior College, New London, N. H. (W. G. Parks, Colby Junior College, New London, N. H.)

17-21 **American Management Assn.,** seminar on packaging management, Colgate University, Hamilton, N.Y. (A.M.A., 1515 Broadway, N.Y.C. 36)

23-26 **National Pharmaceutical Council,** pharmacy education-industry forum, Princeton Inn, Princeton, N. J.

29 **World Medical Assn.,** second world conference on medical education (through Sept. 4). Palmer House, Chicago, Ill. (W.M.A., American Medical Assn., 535 N. Dearborn St., Chicago 10, Ill.)

30 **Federal Wholesale Druggists' Assn.,** annual convention (through Sept. 2), Greenbrier Hotel, White Sulphur Springs, West Virginia (R. C. Schlotterer, F.W.D.A., 2 Lexington Ave., N. Y. C. 10)

SEPTEMBER

9-11 **Pharmaceutical Manufacturers Assn.,** International Section, Greenbrier Hotel, White Sulphur Springs, W. Va.

10-11 **Society of the Plastics Industry,** Midwest Section conference, French Lick Sheraton Hotel, French Lick, Indiana (S.P.I., 250 Park Ave., N.Y.C. 17)

13-17 **International Conference of Esthetics and Cosmetics,** Lucerne, Switzerland (H. Schrocter, I.C.E.C., Generalskretariat: Postfach 217, Basel 1, Switzerland)

13-18 **American Chemical Society,** national meeting, Atlantic City, N. J. (Alden H. Emery, Executive Secretary, 115 Sixteenth St., N.W., Washington 6, D.C.)

14-17 **Associated Chain Drug Stores,** Associated-Benedikt fall meeting, Park Sheraton Hotel, New York City (Harry J. Towers, A.C.D.S., 245 Fifth Ave., N. Y. C. 16)

17-20 **Drug, Chemical & Allied Trades Section, New York Board of Trade,** annual meeting, Sagamore Hotel, Bolton Landing, Lake George, N. Y. (Helen I. Booth, D.C.A.T., 291 Broadway, N. Y. C 7)

20-23 **The Proprietary Assn. of Canada,** annual general meeting and convention, The Chantecler, Ste. Adele-en-haut, P.Q. (Mrs. Agnes Howard, P.A.C., 252 Eglinton Ave. East, Toronto 12, Ontario)

20-24 **National Assn. of Retail Druggists,** annual national convention, St. Louis, Mo. (N.A.R.D., 205 W. Wacker Drive, Chicago 6, Ill.)

23-24 **Society of Cosmetic Chemists,** annual cosmetic seminar, French Institute and New York Academy of Sciences, New York City (Walter Wynn, S.C.C., The New York Academy of Sciences, 2 E. 63rd St., N.Y.C. 21)

24-25 **American Society for Quality Control,** Chemical Division annual conference, Shamrock Hilton Hotel, Houston, Texas.

28 **Salesmen's Assn. of the American Chemical Industry,** annual sales clinic, Roosevelt Hotel, N.Y.C. (S.A.A.C.I., 60 E. 42nd St, N.Y.C. 17)

28 **Instrument Symposium and Research Equipment Exhibit** (through Oct. 1) National Institutes of Health, Bethesda, Md. (James B. Davis, N.I.H., Bethesda, Md.)

28-30 **American Management Assn.,** seminar on packaging line layout, Hotel Astor, N.Y.C. (A.M.A., 1515 Broadway, N.Y.C. 36)

28-30 **American Oil Chemists' Society,** Hotel Statler, Los Angeles, Calif

OCTOBER

1-2 **Society of the Plastics Industry,** New England Section conference, Wentworth-by-the-Sea, Portsmouth, N. H. (S.P.I., 250 Park Ave., N.Y.C. 17)

11-16 **Pan-American Pharmaceutical and Biochemical Federation,** seminar on pharmaceutical education, San Juan Intercontinental Hotel, San Juan, Puerto Rico (Dr. Melvin W. Green, American Council on Pharmaceutical Education, 77 Washington St., Chicago 2, Ill.

14-16 **Pharmaceutical Manufacturers Assn.,** Biological Section, Drake Hotel, Chicago, Ill. (Dr. Karl Bambach, P.M.A., 503-7 Albee Building, Washington 5, D.C.)

14-16 **Parenteral Drug Assn.,** annual convention, Statler Hotel, N. Y. C. (Hubert E. Boyden, P.D.A., 4865 Stenton Ave., Philadelphia 44, Penna.)

17-25 **International Fair of the Plastics Industry** (for producers, processors, machinery manufacturers), Dusseldorf, Germany (German-American Chamber of Commerce, Inc., 350 Fifth Ave., N.Y.C. 1)

19-23 **National Safety Council,** national congress ad exposition, Chicago, Ill. (R. L. Forney, N.S.C., 425 N. Michigan Ave., Chicago 11, Ill.)

19-23 **American Public Health Assn.,** annual meeting, Convention Hall, Atlantic City, N. J.

20-21 **Pharmaceutical Manufacturers Assn.,** Pharmaceutical Contact Section, Washington Hotel, Washington, D.C. (Dr. Karl Bambach, P.M.A., 503-7 Albee Building, Washington 5, D.C.)

22-23 **Pharmaceutical Manufacturers Assn.,** Production and Engineering Section, Van Cleve Hotel, Dayton, Ohio (See above.)

25-28 **National Flexible Packaging Assn.,** fall meeting, White Sulphur Springs, West Virginia)

25-28 **Pharmaceutical Manufacturers Assn.,** Financial Section, Greenbrier Hotel, White Sulphur Springs, W. Va.

NOVEMBER

1-5 **German Society of Cosmetic Chemists,** scientific and cosmetic sessions, Baden-Baden, Germany (Dr. Herbert Neugebauer, Baden-Baden, Metzgerstrasse 30, Germany)

2-4 **American Management Assn.,** seminar on manufacturing's part in the packaging program, Hotel Astor, N.Y.C. (A.M.A., 1515 Broadway, N.Y.C. 36)

2-4 **American Management Assn.,** seminar on printing on packaging, Hotel Astor, N.Y.C. (See above.)

2-4 **Pharmaceutical Manufacturers Assn.,** Research and Development Section, Greenbrier Hotel, White Sulphur Springs, W. Va.

3 **1959 Exposition of Chemical Industry,** Coliseum, N. Y. C. (through December 4)

3-5 **Packaging Assn. of Canada,** national packaging exposition, Automotive Building, Exhibition Grounds, Toronto, Canada

4-6 **Symposium on Antibiotics,** Mayflower Hotel, Washington, D. C. (Dr. Henry Welch, Director, Div. of Antibiotics, F. D. A., U. S. Dept. Health, Education, and Welfare, Washington 25, D. C.)

7-12 **National Wholesale Druggists' Assn.,** annual convention, Americana Hotel, Bal Harbour, Fla. (Harry A. Kimbriel, N.W.D.A., 60 East 42nd St., N. Y. C. 17)

9-11 **American Management Assn.**, seminar on fundamentals of packaging specifications, Hotel Astor, N.Y.C. (See above.)

9-12 **Glass Container Manufacturers Institute**, fall meeting, Arizona-Biltmore Hotel, Phoenix, Arizona (H. W. Kuni, 99 Park Ave., N. Y. C. 6)

12-14 **Gerontological Society**, Statler Hotel, Detroit (Administrative Secretary, Mrs. Marjorie Adler, 660 S. Kingshighway Blvd., St. Louis 10, Mo.)

16-18 **Packaging Institute**, annual national packaging forum, Hotel Statler, N. Y. C. (Charles A. Feld, P.I., 342 Madison Ave., N. Y. C. 17)

16-20 **Fifth International Automation Congress and Exposition**, New York Trade Show Bldg., New York City.

17-20 **Packaging Machinery Manufacturers Institute Show**, New York Coliseum, N. Y. C. (Albert R. Stevens, Elgin Mfg. Co., Inc., Elgin, Ill.)

24 **Manufacturing Chemists' Assn.**, Statler Hilton Hotel, New York City (M. F. Crass, M.C.A., 1825 Connecticut Ave., N.W., Washington 9, D. C.)

30 **Exposition of the Chemical Industries**, New York Coliseum (E. K. Stevens, International Exposition Co., 480 Lexington Ave., N.Y.C. 17)

DECEMBER

1 **Toilet Goods Assn.**, scientific section, winter meeting, Waldorf-Astoria Hotel, N. Y. C. (Kathryn Fitzpatrick, Americas Bldg., Rockefeller Center, N. Y. C. 20)

2 **Synthetic Organic Chemical Manufacturers Assn.**, annual meeting and dinner, Hotel Roosevelt, New York City (S. Stewart Graff, Sec., S.O.C.M.A., 41 East 42nd St., N. Y. C. 17).

7-9 **Pharmaceutical Manufacturers Assn.**, mid-year and eastern regional meeting, Waldorf-Astoria Hotel, N. Y. C. (J. O. Closs, 30 Rockefeller Plaza, N. Y. C. 20)

7-9 **Chemical Specialties Manufacturers Assn.**, annual meeting and aerosol package contest, Mayflower Hotel, Washington, D.C. (C.S.M.A., 50 E. 41st St., N.Y.C. 17)

7-10 **American Medical Assn.**, clinical meeting, Dallas Auditorium, Dallas, Texas

9 **The Proprietary Assn.**, Research and Scientific Development meeting, Hotel Roosevelt, New York City (Dr. Howard A. Prentice, 810 18th St., N.W., Washington 6, D.C.)

1960

JANUARY

9 **Northwest Society for Clinical Research**, Seattle, Washington (Dr. John R. Hogness, 721 Minor Ave., Seattle 4, Wash.)

11-13 **American Academy of Allergy**, Hollywood Beach Hotel, Hollywood Fla. (James O. Kelley, 756 N. Milwaukee St., Milwaukee 2, Wisc.)

FEBRUARY

3-5 **Pharmaceutical Manufacturers Assn.**, Legislative Section, Boca Raton, Fla. (Dr. Karl Bambach, P.M.A., 503-7 Albee Building, Washington 5, D.C.

25-27 **Symposium on Fundamental Cancer Research**, Univ. of Texas, Houston, Texas (Univ. of Texas, M.D. Anderson Hospital and Tumor Institute, Houston 5, Texas)

28 **American College of Allergists** (through March 5) Americana Hotel, Bal Harbour, Miami Beach, Fla. (Eloi Bauers, 2160 Rand Tower, Minneapolis 2, Minn.)

MARCH

2-4 **Pharmaceutical Manufacturers Assn.**, Medical Section, Hollywood Beach Hotel, Hollywood Fla. (See above.)

(Continued on page 270)

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3 **Drug, Chemical and Allied Trades Section, New York Board of Trade, Inc.,** annual dinner (Helen L. Booth, D.C.A.T., 291 Broadway, N. Y. C. 7)

13-18 **National Health Council,** national health forum, Miami, Fla. (Philip E. Ryan, 1790 Broadway, N.Y.C. 19)

15-16 **American Broncho-Esaphogological Assn.,** Deauville Hotel, Miami Beach, Fla. (Dr. F. Johnson Putney, 1712 Locust St., Philadelphia 3, Penna.)

15-17 **American Laryngological, Rhinological and Otological Society,** Deauville Hotel, Miami Beach, Fla. (Dr. C. Stewart Nash, 708 Medical Arts Building, Rochester 7, N.Y.)

18-19 **American Laryngological Assn.,** Deauville Hotel, Miami Beach, Fla. (Dr. Lyman Richards, Massachusetts Institute of Technology, Cambridge 39, Mass.)

APRIL

1-2 **American Gastroenteral Assn.,** Roosevelt Hotel, New Orleans, La. (Dr. Wade Volwiler, Dept. of Medicine, University of Washington, Seattle, Wash.)

1-3 **American Society of Internal Medicine,** Mark Hopkins Hotel, San Francisco, Calif. (Robert L. Richards, 350 Post St., San Francisco 8, Calif.)

2-6 **American College of Obstetricians and Gynecologists,** Netherland Hilton Hotel, Cincinnati, Ohio (Donald F. Richardson, P. O. Box 749, Chicago 90, Ill.)

4-7 **American Management Assn.,** national packaging exposition, Convention Hall, Atlantic City, N.J. (Packaging Exposition, Clapp & Poliak, Inc., 341 Madison Ave., N.Y.C. 17)

5-14 **American Chemical Society,** spring national meeting, Cleveland, Ohio (A. T. Winstead, A.C.S., National Meetings Dept., 1155 Sixteenth St., N.W., Washington 6, D. C.)

8-12 **American Dermatological Assn.,** Boca Raton Hotel, Boca Raton, Fla. (Dr. Wiley M. Sams, 308 Ingraham Bldg., Miami 32, Fla.)

11-15 **American Assn. of Immunologists,** Chicago, Ill. (Dr. Calderon Howe, Columbia University College of Physicians and Surgeons, N.Y.C. 22)

11-16 **American Society of Biological Chemists,** Chicago, Ill. (Dr. Frank W. Putnam, Dept. of Biochemistry, Univ. of Fla., Gainesville, Fla.)

28-30 **American Assn. of Pathologists and Bacteriologists,** Hotel Peabody, Memphis, Tenn. (Dr. Russell L. Holman, Dept. of Pathology, L.S.U. School of Medicine, New Orleans, La.)

MAY

11 **Toilet Goods Assn.,** Scientific Section, Waldorf-Astoria Hotel, N.Y.C. (Kathryn Fitzpatrick, Americas Bldg., Rockefeller Center, N.Y.C. 20)

8-11 **Proprietary Association,** annual meeting, The Greenbrier, White Sulphur Springs, W. Va. (Dr. Howard A. Prentice, 810 18th St., N.W., Washington 6, D.C.

16-18 **Chemical Specialties Manufacturers Assn.,** mid-year meeting, Drake Hotel, Chicago, Ill. (C.S.M.A., 50 E. 41st St., N.Y.C 17)

JUNE

12-15 **Extension Services in Pharmacy,** annual national industrial pharmaceutical research conference (stabilization and stability testing of pharmaceuticals), King's Gateway. Land O' Lakes, Wisc. (Richard S. Strommen, E.S.P., Univ. of Wisconsin, Madison, Wisc.)

27-30 **Toilet Goods Assn.,** annual convention, Poland Spring, Maine, (Kathryn Fitzpatrick, Americas Bldg., Rockefeller Center, N.Y.C. 20) ●

(*Continued from page 240*)

Essential Oils

The latest semi-annual wholesale price list has been published by Fritzsche Brothers, Inc., 76 Ninth Ave., New York City 11. Available on request to those who purchase in wholesale quantities, the list includes essential oils, sesquiterpeneless and terpeneless oils, citrus concentrates, floral absolutes, floral concretes, aromatic chemicals, fixatives, balsams, gums and sundries, tinctures, oleoresins, supersins, and colors.

Metholene Esters

Metholene Esters for Alkylolamides is the title of a new technical bulletin from Emery Industries, Inc., Dept. 5, Carew Tower, Cincinnati 2, Ohio. The bulletin, No. 415, gives the procedure for using methyl esters of fatty acids as intermediates to produce "super" grade amides having active amide contents of more than 90 per cent, compared to the less than 70 per cent obtained by direct amidation of free fatty acids.

Also listed are complete specifications for Emery's Metholine line of methyl esters, from which "superamides" can be prepared having excellent foam stabilizing and viscosity building properties for surfactants.

Molecular Sieves

Chemical Loaded Molecular Sieves, a 5-page booklet, has been issued by the Linde Company, Division of Union Carbide Corp., 30 East 42nd Street, New York City 17. It explains how chemicals are stored in Linde Molecular Sieves; indicates the various established uses of this ability and the sorts of chemicals that can be loaded; outlines a typical case history; and shows how extremely volatile de-tertiary butyl peroxide was loaded to advantage as a catalyst in the manufacture of vinyl-containing silicone rubber. Other uses are suggested.

Polyglycols

The third edition of Choosing the Right Polyglycol has been published by Technical Service and Development, The Dow Chemical Company, Midland, Mich. The 24-page bulletin lists for 40 polyglycols the formula, description, average molecular weight, specific gravity, pounds per gallon, refractive index, pour, flash, fire points, solubility, viscosity index, and viscosity in centistokes.

Minimum Standard Hoist Specifications

The Hoist Manufacturers Association has issued the first of a series of recommended minimum standard hoist specifications, concerned with hoists of the electric wire rope type, their construction and the basic information that should accompany inquiries to manufacturers. Available from members and HMA offices, One Thomas Circle, Washington 5, D.C.

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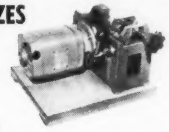
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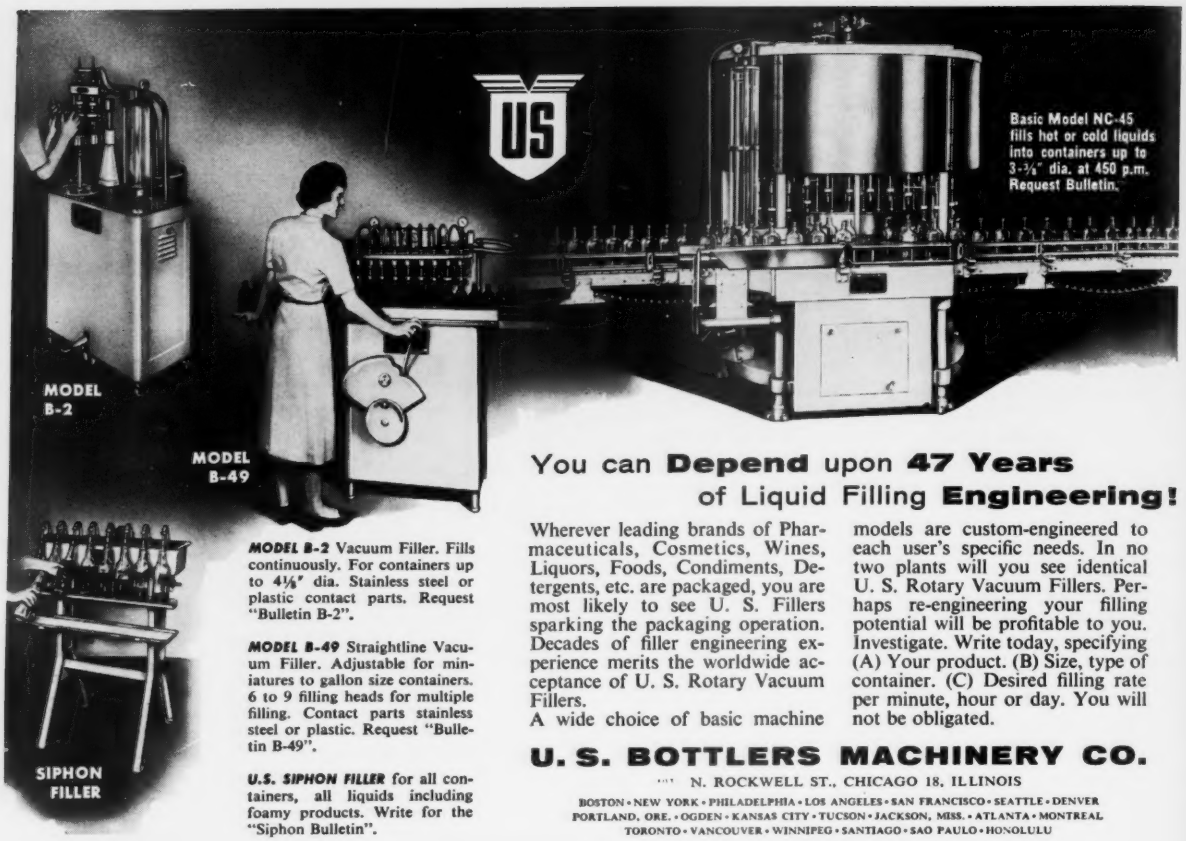
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